

University News

A WEEKLY JOURNAL OF HIGHER EDUCATION

MONDAY, DECEMBER 16, 1996

Rs. 7.00

PAWAN SIKKA

**The Measurement of Science
and Technology**

RAJENDRA PAL

**Academic Orientation of
University Teachers
— A Qualitative Inquiry**

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**Mass Media
— Advent, Onslaught and Hindsight**

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A Tribute to Survival

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**Law — Technology — Politics
— Convocation Address**



Association of Indian Universities



Bharathidasan University Tiruchirappalli - 620 024

State Level Educational Testing (SLET) For Appointment of Lecturers in Colleges and Universities

The Bharathidasan University has been nominated by the Government of Tamil Nadu and the UGC as a Nodal Agency for conducting State Level Educational Testing (SLET) for appointment of lecturers. The SLET will be on the pattern of UGC/CSIR NET. It is essential to pass this SLET or NET of UGC/CSIR or any other State Level Test accredited by the UGC for appointment as Lecturers in Universities and Colleges in Tamil Nadu.

The SLET is scheduled to be conducted on Sunday, March 9, 1997 at Chennai Chidambaram, Coimbatore, Madurai, Tiruchirappalli and Tirunelveli.

ELIGIBILITY

Candidates who have secured atleast 55 per cent marks in Master's Degree or equivalent examination in the following or related subjects from a recognised University are eligible to appear in the Test.

The Post-Graduate Students appearing in the final year/Semester examination to be held in April '97 are also eligible to appear for SLET. Their candidature will be provisional subject to their earning the prescribed minimum marks.

Note : Candidates who got their M.Phil. or submitted Theses for Ph.D. on or before Dec. 31, 1993 need not write this Examination. All other candidates, though with M.Phil/Ph.D. qualification, have to pass this Test (or UGC/CSIR NET) so as to become eligible for appointment as Lecturers.

SUBJECTS

Faculty of Arts/Humanities : Arabic, Co-operation, Corporate Secretaryship, Economics, Education, English, French, Hindi, History, Journalism and Mass Communication, Management, Music, Philosophy, Politics/Political Science, Psychology, Public Administration, Sanskrit, Social Work, Sociology, Tamil; **Faculty of Commerce:** Commerce; **Faculty of Law:** Law; **Faculty of Science :** Biochemistry, Botany, Chemistry, Computer Science/Applications, Electronics, Geography, Geology, Home Science and Nutrition and Dietetics, Library Science, Mathematics, Microbiology, Physical Education, Physical Rehabilitation, Statistics and Zoology.

APPLICATION

Prescribed application form along with the prospectus, syllabus and sample questions can be obtained from Dr. S. Nagarajan, Member Secretary, State Level Educational Testing, Bharathidasan University, Tiruchirappalli - 620 024 on request by indicating the relevant subjects and by enclosing a crossed Demand Draft for Rs. 100/- drawn in favour of BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI. Name, address & purpose must be written on the reverse of the D.D. No other form of payment will be entertained.

Filled in application should reach the University on or before January 20, 1997.

Tiruchirappalli
Dec. 9, 1996

Dr. C. Thangamuthu
REGISTRAR

UNIVERSITY NEWS

VOL. XXXIV DECEMBER 16

No. 51 1996
Price Rs. 7.00

A Weekly Journal of Higher Education published by the Association of Indian Universities

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Editor :
SUTINDER SINGH

The Measurement of Science & Technology

Pawan Sikka*

Science and Technology (S&T) indicators are the important tools for the assessment of country's scientific and technological capabilities. The field of S&T indicators is constantly changing and expanding. Governments are starting to use these indicators as a part of their ongoing analysis. Science Policy planners are using S&T indicators as a part of their resource allocation analysis. Auditors both in the public and private sectors are considering S&T indicators in their programme evaluation. The following S&T indicators can be used for assessing the status of a country:

- (a) R&D — Gross domestic expenditure on R&D as a percentage of GDP; Gross domestic expenditure on R&D per capita population, total R&D scientists and engineers per thousand labour force; and RD expenditure in the business enterprises sector as a percentage of GDP.
- (b) Patents — Inventiveness coefficient; auto-sufficiency ratio and rate of diffusion; and
- (c) Trade — export/import ratio in respect of electrical, electronic, office machinery and computer, and drug industry.

Indicators provide indirect information on the phenomenon or events to which they are applied. An indicator is a measure of one item used to provide information about another immeasurable item. For example, statistics on the number of scientists and engineers, and on their levels of training, are indicators of the quality and quantity of S&T knowledge available. Expenditures on R & D are indicators of the levels and sites of the indigenous generation of S&T knowledge. Patent statistics are indicators of the intensity, direction and location of inventive activity and not innovation.

Scientometrics Models

With a view to measuring the entire process from research to innovation and diffusion, following models have been applied:

(a) Science & technology system can be represented in terms of mainly three interacting stages. According to Freeman the stages considered are basic research, innovative and developmental work, and new types of plants constructed. Inputs and outputs of each stage can be distinguished by indicators relevant to that stage. Freeman has demonstrated the relationship between different parts of research — innovation system — the outputs of one stage are often the inputs to another.

(b) Miles Ian (1984) conceived S&T activities in terms of the complex of organisational practices and flows of knowledge that

*Joint Adviser, Department of Science & Technology,
Government of India, New Delhi-110 016.

stretches from pure and applied to industrial innovations and the use of new technologies by households and communities. The role of S&T in society is seen to extend beyond the formal science-innovation system to include the stock of technology, skills and social knowledge used in production and consumption activities. In a fairly elaborate approach like other social structures, the science-innovation system is governed by social relations. Thus, the technologies of production in advanced countries make use of factors and inputs different from those of the developing countries. Here, the indicators are meant to capture important determinants of social relations in the science-innovation system.

(c) Grupp and Hohmeyer (1988) have advocated a simple input-output model for three stages: research, development and innovation. Indicators to capture R&D expenditure, scientific literature, patent statistics are considered appropriate for the first two stages. For visible results of innovations, econometric indicators become necessary, for example, trade involving research intensive products. International comparisons are made on the basis of specifications of new products and processes in this approach.

(d) A cascade structure as an appropriate way for describing the science and technology system of Japan has been proposed by Niwa et al(1993). This approach addresses two crucial issues: relevancy and causality. In a report on Japanese Science and Technology, indicators have been described in a series of stages whereby each stage derived from or acts upon the products of the preceding stage; this arrangement is termed as a cascade structure which consists of six major categories: societal infrastructure, scientific and technological infrastructure, R&D infrastructure, R&D results, S&T contribution, and societal acceptance of science and technology.

(e) Tijssen et al (1994) have examined the S&T system on the basis of a three tier model for describing different aspects of the S&T system.

- i) Tier one represents the S&T base captured by indicators pertaining to the higher educational system, e.g. number of universities and students; public attitudes towards S&T and its results, unemployment of graduates, post-graduates and doctorates.
- ii) Tier two represents the R&D infrastructure —indicators that cover the direct support to R&D activities, such as S&T manpower, R&D funds, technology balance of payments and institutional framework.

- iii) Tier three comprises R&D results. Output indicators of scientific and technological knowledge in terms of papers published, patents filed and accepted, their citation patterns and national and international collaboration underlying therein.

A set of these interrelated indicators can give a picture of the S&T system and its economic performance thereby helping in assessing the health of the S&T system.

(f) By using database containing articles, patents and standards for developing technology indicators in various disciplines, and concentrating on Technology Indicators, Makovetskaya and Bernadsky (1994) have developed a model of R&D in relation to technology and presented a methodology for the analysis of scientometrics data reflecting dynamics of development of technology oriented R&D, while considering technology system as consisting of three phases: initiation, growth and saturation.

Data Collection

The government's concern for S&T and its involvement in management, promotion and evaluation are now universally recognized in countries with market economies. The concern has primarily been due to some of the key questions related to scientific and technological developments, such as:

- (i) how to develop mechanisms for the effective application of science and technology to national development?
- (ii) what products/and or product groups constitute the proper vehicle for technological development of the country?
- (iii) how to determine the optimum size of investment for R&D related with imported and indigenous technologies and involve private organisations and industries for funding R&D?
- (iv) how to increase the absorptive capacity for the imported technology?
- (v) how to improve the effectiveness of R&D units?
- (vi) how to ensure a gradual growth of basic research?
- (vii) how to create a favourable technology climate?

A number of international organizations are collecting information data which is of relevance for the construction of science and technology indicators viz. WIPRO on patent activities, UNIDO on industrial statistics, IMF on balance of payments, World Bank on social development indicators, and

so on. UNESCO is collecting information on scientific activities and human resource development, specially for developing countries. The main constraint in the construction and application of technology indicators to developing countries is the lack of an integrated information system on technology relevant information in these countries. Secondly, the experience of industrialization and the usefulness of established technology indicators in developing countries vary according to their level of development and industrialisation policies.

The Union Department of Science & Technology (DST), New Delhi has been entrusted with the responsibility of formulation of science and technology (S&T) policies and their implementation. In order to fulfil this responsibility effectively, a reliable database on the scientific and technological resources in general, and their deployment for S&T activities in particular, is a prerequisite. Accordingly, DST undertakes regular national statistical surveys to collect sector-wise data on the resources deployed for scientific and technological activities in the country. In doing so, the UNESCO recommendations regarding international standardisation of statistics on science and technology are kept in view while collecting data on different parameters, for the policy planners particularly concerned about planning, implementation, and management of science in India. In this context, the DST not only continues to provide these specialised services but has also undertaken several new initiatives. "R&D Statistics 1992-93", and "Science and technology pocket data book 1993" are good sources to understand the overall S&T scene in the country and are brought out regularly along with a number of reports like "S&T indicators", "Manpower studies", etc.

Progress Parameters

Scientific and technical manpower constitutes one of the major input resources to S&T activities. It is also an indirect measure of the strength of the country by contributing to socio-economic development through S&T activities. The planning and formulation of science policy requires the total numerical strength of the qualified human resources namely the total stock and the economically active stock of S&T personnel.

Financial and human resources are the main components of inputs to R&D, which could be regarded as indicators of the commitment of government and/or industry towards innovative programs. So, it is easy to measure the different inputs needed for carrying out R&D activities, rather than measuring its output, as these are partly intangible

in nature and are difficult to quantify. The output of R&D could be measured, to some extent, by the following factors:

- (a) publication of research papers and other scientific monographs;
- (b) royalties and fees received by the sale of processes;
- (c) patents and knowhow developed and utilized;
- (d) training of manpower; and
- (e) building capabilities in newer fields.

Conclusion

Though it is very difficult to ascertain with any precision the contributions that S&T make to economic progress, yet it is noticed that countries with a high per capita GNP have a substantially higher research ratio than those with a lower per capita GNP. Thus, one can conclude that there exists a positive correlation between investment in R&D and the economic growth of a country.

There exists no formula for ensuring an optimal allocation of resources among fields (basic, applied or engineering development), disciplines (physics, chemistry, biology) or the projects (lasers, superconductivity, space rockets, earthquake predictions or health). There can be none, because the goals of society involve differing subjective values, making it difficult for men to arrive at consensus. Whether one decides that mental health merits more support than nuclear energy rests on more than purely objective considerations. The most likely approach to making better decisions is to improve our budget-making systems, including assuring that all competent interests have an opportunity to make their cases known. Operations research or system analysis techniques aid only in selecting the right technological options, and not in deciding resource allocations to science and technology since systematic planning requires a good continuously updated information systems and databases. The technical information service can render a useful service in the formulation and implementation of science policy concerned matters. Of course, there is a need to coordinate the activities of various organizations engaged in creating databases concerning various subjects and sectors in India.

S&T indicators are very helpful in making best use of the available resources and are important for any country. These are much more important for a developing economy where the resources are too scarce and demands are high. The growth of S&T

would become meaningful only when it is related to the social and economic needs of the country and takes into account the national development plan.

References

1. Freeman, C (1982) *The Economics of Industrial Innovation*, London, Frances Printer.
- 1a. Freeman, C (1982) *Recent Developments in Science and Technology Indicators*, Science Policy Research Unit, prepared for International Development Research Council.
2. Miles, Ian (1984), *Development-oriented Indicators of the Science and Technology System*, Science Policy Research Unit, prepared for UNCSTD Meeting, Graz.
3. Grupp, H & Hohmeyer, O (1988), "Technology Standards for Research Intensive Product Groups and International Competitiveness." In *Handbook of Quantitative Studies of Science and Technology* edited by A F J Van Raan (c) Elsevier Science Publishers B.V. (North-Holland).
4. Niwa et al (1993) *Reconsiderations of the Japanese Science and Technology Indicators*. Proceedings of NISTEP, the Third International Conference on Science and Technology Policy Research 23-24, Mita Press, Tokyo, Niwa, Fujio; Tomizawa, Hiroyuki, Hirahara, Fumito, Kakizaki, Fumihiko; and Camargo Orlando (1991).
- 4a. *The Japanese Science and Technology Indicator System: Analysis of Science and Technology Activities*, National, Institute of Science and Technology Policy (NISTEP), Science and Technology Agency, Japan.
5. Tijssen, R J W, & Leeuwen, Th. N. van, Verspagen, B and Slabbers, M (1994) *Science and Technology Indicators 1994 :Summary and Conclusions*, The Netherlands Observatory of Science and Technology, July 1994 P.47.
6. Makovetskaya, O and Bernadsky V (1994), Scientometrics Indicators for Identification of Technology System Life Cycle, Phase, *Scientometrics* Vol. 30, No.1 105-116
7. *Research and Development Statistics 1992-93*- Govt. of India, Department of Science & Technology, New Delhi, 1994.
8. Ashok Jain et al — *Indicators of Indian Science and Technology*, Segment Books, NISTADS, New Delhi, 1996.
9. Pawan Sikka and V.K Gupta— S&T Indicators for Sustainable Development. *Invention Intelligence*, July 1995.
10. _____ . *Science Policy Formulation and Implementation in India*. *Journal Science and Public Policy*, UK, December 1995.
11. _____ . *A Critical Study on the Management of Science in India*. Meerut University D.Sc.Thesis (unpublished). Meerut, 1993.

Annexure-1

Important S&T Indicators for India

- * Plan allocation for S&T increased from Rs. 142 crores in fourth plan to Rs. 9180 crores during the eighth plan. During the eighth plan, the share of S&T plan outlay in the total public sector plan out was 2.1%
 - * The national investment of R&D activities attained a level of Rs. 5141.64 crores in 1992-93. The same for the year 1993-94 has been estimated to be Rs. 5733.43 crores.
 - * 0.83% of Gross National Product was devoted to R&D activities in India during 1992-93.
 - * Sectorwise percentage share of national expenditure for 1992-93 was Central Government institutions 64.3%, State Governments 9.3% public sector industries 11.4% and private sector industries 15.0% respectively.
 - * Industry spent 0.57% of their sales turnover on R&D in 1992-93. Rs.182.42 crores of R&D expenditure by industrial sector was in the group of defence industries, followed by electricals and electronics group with Rs. 175.72 crores.
 - * As on 1st April, 1992, nearly 2.93 lakh personnel were employed in the R&D establishments in the country including in-house R&D units of public and private sector industries. Out of this, 32.5% were performing R&D activities, 33.5% were performing auxiliary activities and rest 34.0% were providing administrative and other non-technical support. There were 8490 female scientists directly engaged in R&D activities.
 - * There were 183 universities/deemed universities, 10 institutions of national importance and 7513 colleges during 1991-92 to impart higher education in India.
- United States of America topped the list of applications for patents filed in India by foreign countries with a percentage share of 44.8%.
- * Pure science doctorates had a share of 64.4% of the total 4579 S&T doctorates produced by the educational system in India during 1990-91.
 - * Patents sealed in the year 1991-92 was 1676 and out of which 551 were sealed by Indian citizens. This is a mere 32.9% of the total patents sealed in India. Maximum number of applications filed by Indians were from State of Delhi with a percentage share of 30%.
 - * Academic sector received 56% of the total extra-mural R&D support during 1992-93.

Academic Orientation of University Teachers

A Qualitative Inquiry

Rajendra Pal*

Prologue

In pursuance of NPE, 1986 the Government of India, Ministry of Human Resource Development (MHRD) and University Grants Commission (UGC) have taken several steps to improve the status and motivation of university teachers. One of the main features of their programs and strategies is to inculcate dynamism in higher education system by providing training to its teachers. In 1987-88 UGC had established 48 Academic Staff Colleges (ASCs) for organizing orientation programs for newly appointed lecturers and conducting refresher courses for inservice teachers.

The main objectives of ASCs are to enable the newly appointed teachers to: (i) understand the significance of education in general and higher education in particular, in the global and Indian context, (ii) understand the linkages between education and economic and socio-cultural development with particular reference to Indian policy, (iii) acquire and improve basic skills of teaching at college/university, (iv) be aware of the development in his/her specific subject; and (v) utilize opportunities for development of personality, initiative and creativity.

In order to achieve the above objectives the curriculum for academic staff orientation course has the following components:

Component A: Awareness of linkages among society, environment, development and education;

Component B: Philosophy of Education, Indian education system, and pedagogy;

Component C: Subject Upgradation;

Component D: Management and personality development; and

Component E: Monitoring and Evaluation.

The ASCs are functioning as per the guidelines given by the UGC. But nature and process of its orientation programs has been questioned time and

again by many participants, resource persons, experts, intellectuals, teachers, administrators, and educationists etc. The main issues raised by them are regarding its curriculum, teaching learning methodology, need, its linkages with career advancement scheme and the like... These issues need to be resolved as soon as possible.

Significant evidence is not found to overcome these difficulties and issues of orientation program. Perhaps ASCs are also using the evaluation proforma developed by NIEPA, just to fulfil the necessary progress report. Passi and Pal (1987-96) are conducting empirical studies starting from the first program of ASCs. It is observed by them that respondents (participants and resource persons) hesitated to give free and frank opinion through structured questionnaire. It is also found that their responses were sometimes very vague, mechanical and value oriented. In other words satisfactory, critical, innovative and qualitative suggestions could not be received from the respondents. This situation has necessitated undertaking of a qualitative study.

The Purpose

The purpose of this study was to understand the meanings of the views of an expert with regard to the following aspects of orientation programs of ASCs:

- (i) Teaching difficulties faced by the new teachers;
- (ii) Need of orientation program;
- (iii) Linkages of orientation program with career advancement scheme;
- (iv) Frequency of orientation program for a college/university teacher; and
- (v) Follow-up programs.

Methodology

A qualitative interview of an expert from the field was conducted with a view to know certain aspects of orientation program stated above. Here the researcher knows that a series of sequential interviews should have been conducted to clarify the

*Lecturer, Central Institute of Educational Technology, Chacha Nehru Bhawan, NCERT, New Delhi-110 016.

points which need a further explanation but for want of time on the part of the respondent it was difficult.

Scientific and objectivity dominated traditional researchers might object to the inclusion of the description of the researcher and that of the expert resource person. But it may be noted that qualitative researchers have their own considered response to counter act this view point and argument.

The Researcher

The interviewer is a qualified research scholar. Since the beginning of the scheme of ASCs he is engaged in conducting research on various aspects of orientation programs at higher education stage viz. selection of participants, curriculum of orientation, its evaluation and effectiveness, presentation skills of resource persons, use and distribution of reading material, teachers characteristics and the like.... He has been observing several orientation programs, annual meetings of directors of ASCs and has also interacted with participants, resource persons and directors at different universities. He has to his credit a couple of research papers/articles on various aspects of orientation programs including his Ph.D.

The Expert

The interviewee Dr. Sneha (hypothetical --- the real name of the expert is not mentioned to maintain confidentiality) is now retired as Professor and Director of an ASC having 33 years of teaching experience at college/university level. Her areas of interest are mass communication, educational technology, adult education, education reform, restructuring of courses etc. Dr. Sneha served educational institutions in India and abroad, and was associated with an ASC for five years.

Discussion of the Results

The detailed discussion of the interview under five heads as per the purpose of the study are presented below:

Teaching difficulties faced by new teachers

It has been recognized by various committees and commissions on education (including Kothari Commission, 1964-66) that newly recruited teachers face some problems/difficulties when they start their career as a teacher in the college/university. When asked about the teaching difficulties generally faced by newly recruited teachers in colleges/

universities, Dr. Sneha mentioned communication and delivery of lectures as main problems faced by newly appointed teachers. Other than these they also face the problems of handling the students and classroom control management, she added.

In support of the above statement the investigator would like to quote the opinion of (late) Professor G.Ram Reddy, formerly Chairperson UGC, who also felt that academic control was quite difficult and different than the administrative control. While addressing to the directors of ASCs in a review meeting Prof. Reddy substantiated the statement by presenting the real life situation of a lecturer. He said that a newly appointed lecturer, having first class degree (gold medalist), from the first day of teaching career faced mischievous activities of the students. Similar situation continued for a long time. Out of sheer disgust the lecturer resigned after two/three months. He appeared in the civil service examination, and got selected as IPS officer. Now a days he is a DIG. The failure teacher who was unable to control the class room situation is now successfully controlling the administration of five districts, concluded Professor Reddy.

When we analyze the teaching difficulties listed by Dr. Sneha, it may be concluded that most of the problems are related with communication. Here it should be borne in mind that her main area of interest is mass communication. Therefore, it is also possible that she could be a little bit biased or she might not have taken cognizance of other difficulties. The truth is yet to be verified.

About the observation of her friend's/colleague's difficulties the expert indicated very serious lacunae of our education system in a slightly complaining tone "we do not have provision to observe our colleagues' classroom activities." It is to be remembered that the Education Commission (1964-66) has also suggested that junior teachers should be encouraged to attend the lectures of some senior teachers of their subjects to study their methods of teaching and ways of handling their students. After the lectures, the senior teacher can discuss his methods and techniques with his junior colleagues who should be free to express their opinion and raise questions. The expert admitted that new teachers face a variety of problems but they do not unveil them because others ridicule them. However, she denied that new teachers face content problems.

The expert recommended that a newly appoint-

ed teacher should prepare outline of his/her lecture before presentation and modify it on the basis of self evaluation, students' perception and advice of the seniors.

Need of orientation program

It is believed that the newly appointed lecturers need to be oriented to become effective teachers (UGC, 1987). The NPE, 1986 and its revised version 1992 also recognized its need for improving the status and motivation of colleges teachers. While commenting on the need of orientation program the expert felt the need of orientation for new teachers at higher education. She rationalized her statement that in every field (such as bank, army, legal and medical profession) there is a need of orientation, then why not in teaching. She said that teachers needed orientation to improve their knowledge with regard to student psychology, teaching learning psychology, code of professional ethics and special emphasis should be given to improve teaching skills. Here it is to be noted that most countries' institutions of higher education employ a great number of criteria for the selection and promotion of faculty members. Teaching skill is not universally regarded as a major criterion and as a result, training for teaching is not highly developed (Main, A.N. 1987). In this context the suggestion of the expert is certainly valuable.

The expert is in favour of giving orientation to senior teachers also. When asked about it she said that through senior teachers gained some knowledge of teaching by their experience but they learnt it randomly. There was a need to give systematic orientation to them, mainly about student management and classroom management. But many a time in informal interactions senior teachers denied the need of orientation. Yet there is a need to interview the participants in this regard.

Linkages of Orientation with Career Advancement

UGC recommended in 1987 that confirmation of the newly appointed lecturers should be linked with successful completion of an academic staff orientation course. Those lecturers whose achievement at the course was unsatisfactory should be asked to go through the course a second time before confirmation. Those newly appointed lecturers who had already been confirmed should also be required to undergo the course. The UGC has not mentioned the criterion for those who are already confirmed and whose achievement is not satisfactory. The expert,

Dr. Sneha, also expressed the view that orientation program should be linked with career advancement scheme. She said that every college teacher must be rewarded after attending the orientation program. When willing participation of college teachers is questioned by the investigator, the expert argued "when a lecturer is sent for orientation, it is the responsibility of the ASC to motivate and change his physical participation into willingness. Dr. Sneha described her experience that initially most of the teachers going for the orientation program did not show their interest in the program. Participants also got angry with the resource persons who treated them as students and used the word "Balak". She complained that some resource persons are also very slow in their delivery of lectures. In response to the question as to how she resolved this problem, she said that the resource persons were requested to treat the participants as their colleagues and deliver lectures fast with relevant material. Most of the participants (80-90%) were motivated, she said. While elaborating the ways of linkages she mentioned three dimensions (i) confirmation, (ii) increment, and (iii) advancement. How these three dimensions can be linked with orientation is yet to be verified. The investigator feels that such a flexible strategy be evolved, by which orientation program should be linked with career advancement scheme without affecting the willingness of the participants.

Frequency of Programs

How many programs should be attended by a lecturer in his/her career is not clear in UGC guidelines for ASCs. The expert does not believe in giving more than one orientation program to college teachers. When sufficiency of an orientation program was questioned, she explained that reading material should be provided to the college teacher through principal before he/she went to the orientation program. Even after orientation program some material should be given. As to the type of material, she suggested that material developed by IGNOU for its diploma program can be modified and distributed to the participants. Dr. Sneha advocated at least four refresher courses for a teacher in his/her career. New knowledge emerging in the field should be known to him/her, she said.

The researcher feels that one orientation program is not sufficient for whole career of a teacher, because the teaching techniques/theories also change from time to time just like content of a subject.

Follow up Programs

To know the performance and to evaluate any program it is necessary to develop follow up strategies. About the follow up program the interviewee is in favour of reports given by principal and managements. Teachers can also send their perceptions, but others' perceptions like those of students and managements are more reliable. The expert also suggested a good idea about follow up program. She said a small follow up committee may visit the college and observe actual situation and rectify their problems through a three day follow up training. In a report (NIEPA 1993) a group of Directors ASCs had also recommended a committee of Directors (about 7) to co-ordinate the impact and follow up studies. The report also suggested that each ASC may interview ex-participants of both orientation programs and refresher courses personally and questionnaires should be sent to all ex-participants. Selected ex-participants students, their colleagues and principals may also be interviewed to find out impact of training on participants and on all concerned.

The investigator thinks that for follow up program the teachers' perceptions are more useful because they can use the new strategies at ASCs in classroom situation only with available resources and follow up committee (suggested by the expert) should help the teacher to modify the strategies as per the situation.

Epilogue

On the basis of the experiences shared by the expert and discussions in the light of the suggestions/recommendations of various education commissions/committees and research studies, it can be concluded that college teachers are facing various problems during their day to day classroom teaching viz communication, delivery of lectures, handling of students etc. To overcome these difficulties they need a systematic orientation. This orientation program should be linked with career advancement scheme, but with a flexible strategy so that teachers can participate willingly. A follow-up committee should be formed to co-ordinate the impact and follow up studies.

However, more sequential interviews should be organized to collect more authentic information about problems and process of academic orientation programs.

[The author is grateful to Dr. B.K. Passi, Vice-Chairman, NCTE, New Delhi, for his kind guidance and encouragement to prepare this paper].

Bibliography

- Report of the National Commission on Teachers-II 1983-85* New Delhi, Controller of Publications, Government of India; 1986.
- Dhar, B.B. and Sing, I. *Academic Staff College : A Developing Concept*, New Delhi; Sterling Publications, 1990.
- Jain, R.P. *Faculty Development, New Frontiers in Education* Vol XIII No. 2 April-June 1983.
- Education and National Development : Report of Education Commission (1964-66)* National Council of Educational Research and Training, New Delhi, 1971.
- Report of the CABE Committee on Policy*. Department of Education, Ministry of Human Resource Development, Government of India, New Delhi, 1992.
- National Policy on Education, 1986*. Department of Education, Government of India, New Delhi, 1986.
- Program of Action, 1986*. Department of Education, Government of India, New Delhi, 1986.
- National Institute of Educational Planning and Administration, New Delhi. *Planning and Implementation of Academic Staff Development Programs : Review Meeting of Directors of ASCs*. Higher Education Unit, New Delhi, 1993.
- Pal, Rajendra. *Evaluation of Academic Staff College*. Unpublished M.Ed dissertation, Institute of Education, DAVV, Indore, 1988.
- _____. *Curriculum Development for the Orientation Program of Higher Education Teachers*. Unpublished M.Phil dissertation, Institute of Education, DAVV, Indore, 1989.
- _____. *Curriculum of Academic Staff College - Views of Administrators and Participants*. *University News*. Vol. XXXI, No 20, May 17, 1993.
- _____. *Academic Staff College Programs : A Response to the Proposed New Model*. *University News*, Vol. XXXI, No. 29, July 19, 1993.
- _____. *Uchcha Shiksha Shikshkona ka Vyavasayak Prashikshan. Uchcha Shiksha Patrika*, (pawas), University Grants Commission, (pawas) 1994.
- Passi, B.K. and Pal, Rajendra. *Academic Staff College — The Relevance of their Curricula*. *New Frontiers in Education*. Vol XXI, No. 3, July-Sept. 1991.
- _____. *Resource Persons of the Academic Staff College*. *New Frontiers in Education*, Vol. XXII, No. 3, July-Sept. 1992.
- _____. *Acceptability of Curriculum of Academic Staff Colleges*. *University News*, Vol. XXXII, No. 16, April 18, 1994.
- Towards an Enlightened and Humane Society : NPE, 1986 — A Review*. Department of Education, Government of India, New Delhi, December, 1990.
- Rao, P.H.S., and Palson, M.N. *Training for Higher Education*. Rawat Publications, Jaipur 1994.

MASS MEDIA

Advent, Onslaught and Hindsight

S.D. Desai*

Man felt the need to communicate, has developed a wide range of means of communication and can add to and adapt them from time to time to be in tune with society. At this point of time in history, towards the close of the 20th century, the target audience of such communication runs into millions at a time. The means of such mass communication in themselves have been a major contribution to social ways of living, and development contributions through them keep being made to society continually at an increasing rate.

The media of mass communication are ubiquitous today. It is significant, however, to note that except for newspapers, there have not been very many years since the time they emerged as active developmental factors. The world is celebrating completion of 100 years of motion pictures. Though radio was invented in 1885, it became a household thing in the thirties and portable transistor sets became popular as late as in the sixties. Invented in 1926, television found place near the hearth only a couple of decades ago. And it seems as though television sets slipped into our homes here in India only the other day.

The advent of mass media, in the perspective of history, is thus recent. Their growth, however, is prolific and their capacity to affect audiences is phenomenal. A word in print is taken, even by an average educated person, as an impeccable source of information, sometimes knowledge. In the case of movies and soap operas, the medium has nearly become the message. The media have brought about a sea change in the life style and attitudes of people.

The subject of discussion with the intellectual and the common man, the social thinker and the charlatan, has been for quite sometime what in their perception is the unhealthy influence and damaging capability of the media. They have been accusing mass media of lowering taste and degrading

morals. They see a collapse of the very civilization mankind has built over years and visualize mass culture with dinosauric strides running over remnants of mankind's hard earned cultural gains. Individuality, they feel, is gradually getting stifled. At this rate they fear, mass media will one day play a requiem of civilization.

The situation is not so alarming that critics need to cry wolf. Their criticism is in line with the hostility great and small minds alike in any age have expressed against fresh developments in mass communication. "Shall we simply allow our children to listen to any stories that anyone happens to make up?" asked honourable Plato over 2400 years ago. "I have never read any memorable news in a newspaper", Thoreau declared around 1850.

Nevertheless, those working in the field of development communication would do well to see a grain of truth in the criticism of the functioning of the mass media today. The mass media are not seen contributing to both continuity and change, the two requisites of a balanced, healthy society. The dangers critics associate with them today are those caused by their amateurish use, conducive fully neither to the continuity of the cultural heritage nor to the change compatible with the time.

The dangers perceived entail upon the new crops of development communication experts fresh insights into the nature of their work. The emphasis hitherto seems to have been more perceptibly on developing the necessary skills. This stress needs to be balanced with a strong emphasis, among other things also on the aesthetics of the work being done and its correlation with our cultural heritage, and a good orientation in the use of the language. Implicit in the awareness of the cultural heritage is also a grounding in morals and values.

This kind of overall enlightenment can have a strong bearing on communication content and strategies, which can in a major way, if not fully, answer criticism against mass media. If on the one hand, the media should focus attention on the uplift of the

*Lecturer in English, H.L. College of Commerce & Drama
Critic, *The Times of India*, Ahmedabad.

masses, to whom a struggle to survive is what life means, and other development programmes, they are expected, on the other, to devote space or time, as the case may be, to cultural aspects of life.

One more point that merits attention is that a compact, research-based presentation carries credibility and propagation of ideas can take place effectively through persuasion. Homilies have strong in-built repugnance possibilities. Off-repeated aphorisms and quotes our media ritualistically use on special occasions either do not create any impact at all or maybe prove counter-productive. Similarly, suggestions, perhaps, work better, than direct preaching in developmental programmes and presentations.

Verbal skills, judging by the quality of the language used by our media, are in the danger of bowing out in deference to media skills. Like the proverbial prodigal, we have been wasting words, space and time through the media, repeating time and

again socially insignificant ritualistic activity, most of it political. Discretion, perhaps, is the better part of obedience.

Finally, society consists of individuals. Development communication, therefore, should be directed no less to individuals as to the masses. If the masses need to be lifted up, individuals need the right kind of ambience for their growth too. It is a naive view that associates with development only physical conditions with near complete disregard of the creative and innovative impulses of individuals that keep a civilization going.

Teaching programmes, therefore, must ensure that there are in-built components in the relative course designs, which show susceptibility to the need of awareness on the part of the participants as regards aesthetics, the arts, cultural continuity, contemporary demand of social change, verbal communication efficiency and factors affecting efficacy of audio-visual communication.

CALENDAR OF EVENTS

Proposed Dates of the Event	Title	Objective	Name of the Organising Department	Name of the Organising Secretary/ Officer to be contacted
Dec. 27-28, 1996	National Conference of the Indian Council for Research in Educational Media	Theme : Directions for Development in Educational Technology	Indian Council for Research in Educational Media, Tiruchirappalli	The Secretary, Indian Council for Research in Educational Media, Post Bag No.1, Khajanagar PO, Tiruchirappalli-620023
Dec. 28-30, 1996	International Conference on Information Technology in Education and Training	Theme: Information Technology in Education and Training	All India Association for Educational Technology, New Delhi.	Dr. D.N. Sansanwal, School of Education, Devi Ahilya University, A B Road, Indore-452 001
January 4-6, 1997	26th Annual Convention of ISTE	Theme: Technical Education: Prescription, Assessment and Control of Quality and Development Policy	Indian Society for Technical Education, New Delhi	The Organising Secretary, ISTE Secretariat, M.R. Engineering College Jaipur - 302 017 (Raj.)
Jan. 28-31, 1997	National Seminar on Curriculum Planning, Implementation and Evaluation	To evolve strategies/ models for Curriculum Planning	Guru Nanak College, Chennai	Prof. P. Ramani, Course Director, Guru Nanak College, Velachery, Chennai-600 042
Jan. 29-31, 1997	16th Annual Convention and Conference on Access to Electronic Information	To focus on present changes, challenges, responsibilities and future probabilities in accessing electronic information	Society for Information Science, Bhubaneswar	Dr. P. Padhi C/o Department of Library & Information Science, Utkal University, Vani Vihar, Bhubaneswar-751 004

Use of Educational Media in English Language Teaching

R. Balakrishnan

Nowhere in the field of education the impact of audio-visual aids is so keenly felt as in the case of language teaching. For, language is an abstract concept that is discernible only in concrete communicative acts. Language teaching is basically different from the teaching of other subjects inasmuch as it aims at the development of language behaviour on the part of the learner while the aim of teaching other subjects is acquisition of cognitive knowledge. Use of language is a reflexive skill like riding a bicycle or driving a car.

Environment has a very strong influence on the learning of reflexive skills. Appropriate environment provides necessary stimuli for effective learning. The child learns its mother tongue more readily and easily because of the conducive environment provided by the parents at home, the neighbours and peers apart from the teachers at school. But when the target language happens to be a foreign or second language, the environment in which it has to be learnt is completely different from the environment in which the first language is learnt.

Environment and ethnology go hand-in-hand and therefore, the language teacher has to create the ideal environment appropriate to language acquisition. It is quite impossible to create a typical London street scene inside the classroom to teach English. However, educational technology comes to the rescue of the language teacher in this regard. The hardware as well as the software aspects of educational technology give a lending hand to the language teacher in creating the approximately appropriate, if not ideal, environment to facilitate effective processes of language teaching and learning.

Since language is an abstract concept, the very essence of language teaching solely depends upon the ability of the teacher in concretising and contextualising language features in the form of communicative acts. But concretisation and contextualisation cannot be done successfully by

notes and lectures alone. Language is not learnt by the mere act of taking notes but noting the acts of communication for imitation.

Visual materials presented through teaching aids, like an overhead projector, provide the appropriate context of situation, though, they cannot concretise the language interaction involved in the context. The teacher has to supplement the visuals, with his own version of the interaction that could have possibly taken place. Visuals are more useful in giving practice to the learners to construct sentences and to formulate utterances.

It has now been accepted as an offshoot of the audio-lingual method, that the teaching materials to the language learner should be presented in the order of listening, speaking, reading and writing. The emphasis is on the primacy of speech and aural-oral activities. Tape recorders, video cassette players and other audio-visual equipments ideally suit this purpose. These equipments can be used to

- a) record the oral recitals and simulated conversations of the learners for self-observation and correction;
- b) record the lectures of the experts, and teachers for listening practice; and
- c) record and play the utterances of native speakers, which is otherwise called as 'full language' or 'authentic language' in different contexts.

The recorded versions of the language enable the learners to grasp the characteristic features of the target language like stress, intonation, rhythm, juncture etc, in addition to observing of extra-linguistic features such as gestures, body movements etc. Video and television are more effective tools to note the extra-linguistic features of the language.

Mass media like radio and television have greatly enhanced the chances of learning a foreign language, especially English, through the broadcasts of cine-films, dramas, debates, entertainments, sports and news in the target language.

(Contd. on page 13)

*Teaching Research Fellow (English), A.C.T.,
Anna University, Madras-600 025.

A Tribute to Survival

Gitika Dutta-Dhupkar

Years back, I came upon a slim volume by Khalil Gibran, *The Prophet*, the book has left a strong impression on me and touched a special corner in my heart, a book that has stayed with me to surface now and then with its universal appeal to play eternally on my conscience and which was capable of touching a personal cord thereby creating a lasting friendship.

Being an academician, and the type of work that I do — teaching, research, publishing — all entails a lot of reading, besides I have a passion — say obsession for books. So amidst my wide readings, I have come across books that I have admired; books that made me wonder at, books that I understood (as I thought so), books I learned from, books from where I acquired knowledge, books that shocked, books that infuriated me, books that entertain me and books that I can relax with, but there are few books that touched me, and grew within me by their humane pathos, universal truth, simplicity, and lack of pretentiousness, books that have directly come out of the writer's heart. The book, *My story.... Our story of Rebuilding Broken Lives*, by Flavia Agnes (Majlis, Bombay, 1990) has had the same impact on me.

This slim autobiography comes like a tear drop and falls amidst the surging waves of human experience and expressions and creates a ripple more penetrating and lasting than a storm. It comes like a throttled cry of a woman amidst the din and noise of women's emancipation.

This is not a biography of a great heroine, as in the words of the author, "autobiographies are written only by successful people, not by failures in life. Everyone wants to remember a glorious past, no one wants to relive a life of shame and degradation. It is not easy to strip your soul and lay bare your feelings and emotions for everyone to see..." It is not

even a description of any spectacular event, it is a living experience of a woman who lived and dared to pen down her story. As the author says, "this is not a short story nor a fictionalised autobiography, but true facts about my life. Truth has many facets, many dimensions. But this is the truth about my situation, as I perceived it." Flavia's autobiography does not call for pity or sympathy, for that would be a great insult to the writer. It calls for empathy and invites you to participate in the saga of human experiences and emotions, to celebrate the struggle and determination of the human spirit.

This book is not a feminist revolt, it is about "a conflict and dilemma of a woman torn between a bad marriage on one side, and on the other side freedom, but into a strange, alien and hostile world — a male-defined and male-dominated society, an oppression unfamiliar and hence more frightening, especially for a woman who had been just a house-

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wife for 13 years." Both ways a devil's choice, and it's a story of a woman who not only opts for one of the devil's choice — liberation, but also creates a woman's movement and starts a woman's organisation, thereby transforming a negative experience into strength and conviction, a woman who decides to be a survivor and not a victim.

This book besides being a saga of a battered woman and the writer's tryst with destiny and to her determination to rebuild the lives of many more such women, it also comes as a jolt to various women's organizations, women activists, feminists and all those who are associated with the emancipation of women. For the writer appears to be pessimistic about the situation, and coming from a woman who has gone through everything possible for a woman to go through; a woman actively associated with the women's movement and a practising Iswyer, her remarks cannot be taken lightly. In the words of the writer, "After my negative experience with the legal system, why have I chosen this work? Perhaps we have now realised the complexity of the forces which work against women and our own inadequacy to counteract them." She further adds, "Over the years, socially and economically the situation has become even worse." And the writer asks, "Can there ever be a 'perfect' solution to a battered woman

within this society which is so wrapped? A very big question indeed."

Another painful truth that emerges out of Flavia's writing is that, even in this movement there is a lot of hypocrisy and shame. In the words of the writer "The gains of the movement are reaped by few women from the upper strata. While there are more scholars 'researching' on women, more journalists' writing about women issues, more artists 'expressing' women's concerns, more institutions 'solving' women's problems — the movement itself has received a setback...." And the writer feels, that under these circumstances, where mere survival is at stake, there is a pressing need to explore all existing avenues of support however inadequate and meagre they might be. "An alternative to the biological family must evolve".

This book besides depicting the story of a woman and the brutal realities, helps also to provide a firmer ground for common struggle for women to stand on, it gives authenticity to the absurdities and extremities of a violent situation and a dignity to the contradictions and confusions in our choices.

This book is a tribute to survival and a provocation to emerge out of the battered syndrome. But, when indeed "will someone turn on the light?"

Use of Educational Media in English Language Teaching

(Contd. from page 11)

The key to effective teaching in general and language teaching in particular, is the captivation of the sensory organs of the learner. The sensory organs are the inlets of information to the brain. If what is to be taught is to reach the mind of the learner, the sensory organs of the learner have to be finely tuned. It is only when the sensory organs are alert that perceptions are possible, leading to concept formulation.

A dull lecture and drab classroom environment will not only dampen the spirit of the learner but also thwart any effective learning. But the colourful and lively presentation of pictures and films will certainly kindle the interest of the learner and sharpen his wits. Visuals provide variety in the presenta-

tion of learning materials. Variety makes the learner watchful. Arousing and sustaining the interest of the learner is achieved by audio-visual aids.

Interest and motivation are the prerequisites of learner readiness as postulated by educational psychology. The principles of educational psychology form the software aspect of educational technology while the use of mechanical aids like audio-visuals form the hardware aspect of educational technology. To ensure a successful integration of experience with learning, an effective language learning process should invariably involve the effective application of the techniques offered by the innovations in educational technology.

Law - Technology - Politics

Dr. A.P.J. Abdul Kalam, Scientific Adviser to Raksha Mantri and Secretary, Department of Defence Research & Development, delivered the Convocation Address at the fourth annual convocation of the National Law School of India University, Bangalore. He said, "With the revolutionary advancements in the fields of information technology, communications, transportation and travel coupled with good international network of banking and financial services, the markets and economies of most of the world countries are becoming more closely linked with each other. Gains of one country may lead to certain loss for other country. Therefore, industrially developed countries are trying to make laws and treaties to suit their national interests and priorities, instead of working for win-win partnership." Excerpts.

The Law community has to combat various problems that are coming continuously from various quarters, particularly from foreign sources and instigated sources within the country, against the progress of the nation, a post independence phenomenon. I am directly concerned with specific instruments of international coercion and injustice, such as NPT, CTBT and MTCR as also inequitous trading and technology arrangements such as WTO and TRIPs. Our Law, not less than our national will has to address these instruments of coercion to ensure that development of Science and Technology in India is progressed to the needs of the country.

II. Law, is it Universal?

Law and judiciary have very important role in development of a society. Law essentially plays the balancing role and ensures justice and fair-play when new opportunities and challenges are opening up in the developing society. It is reported in the earlier phase of Indian history before invasions that laws were very simple and were basically catering to maintain the prevailing social order, good morality and uplift-

ment of all segments of the society. With time, the social system has gradually become more and more complex. Such complexities have further grown rapidly with modern industrialisation, tremendous increase in population and resultant increase in scarcity of natural resources. As the Law has to address to the imbalances in the society, gradually, in all countries, laws have progressively become more and more national. Today we have well conceived laws in various areas which were unheard of, or some of them were unimaginable in the previous centuries. We already have Laws of the Sea, Laws of Air and Space, Laws on Environment and also the Intellectual Property Laws.

The inequitous principle of "first to occupy" is being used to preempt important slots of the geo-synchronous orbit focused to the Indian Ocean region. These have been hijacked by the developed world. India should ask them to vacate these important slots for our communication satellites.

III. Laws Driven by National Priorities

In all times and in all countries, Laws have been driven by

the social, technological and national goals and priorities. Laws are framed to ensure equality of opportunities to all and fair practice in trade and related dealings. India is now on the path of rapid industrial and technological advancements. Our laws have to provide adequate protection in this national endeavour. Our Government has adopted policies of techno-economic liberalisation which are attracting corporations of the west, in a big way. They see India as the greatest untapped business opportunity. India's market is one of the most attractive, and fast growing. India is world's 10th largest economy, seventh largest land area and fourth largest rail system, in addition to the second largest population. India is a democratic country with very strong and independent legal set-up. Thus, they perceive India as very attractive and safe market for their goods and technologies. Already, India is attracting increased amount of Direct Foreign Investment. Gradually, we are getting networked into the global economy. This brings for us the opportunities for rapid industrial and economic growth and at the same time, the problems related to fierce trade competition and corporate raiding and take-overs. We have to make suitable laws to ensure that the incoming trade enterprises do not set their undue market dominance at the cost of our technology and industry. History should not repeat through so called "Technology Carriers", which may well be Technology Trojan horses.

IV. Laws to Promote Technological Self-Reliance

India is today making rapid strides in certain technological fronts. India has been successful

in establishing good network of dams, power stations, railways, communications and a large industrial infrastructure. We are self-sufficient in agricultural food production and even export food-grains and processed food products. We have also succeeded in developing our own indigenous satellites; three launch vehicles namely SLV-3, ASLV & PSLV; sophisticated telephone exchanges, Radar systems and satellite communication systems etc. In the recent years, with the successful development of state-of-the-art main battle tank ARJUN, surface to surface missile PRITHVI and the AGNI system, our scientists and engineers have demonstrated that we are capable of developing world class technological systems. The above successes have attracted mixed response from our friends in the western world. Our drive for technological self-reliance contributes to our national prosperity, but reduces other countries' export to India. Thus our increased strength in this direction has an adverse impact on the sale of their goods and techniques.

Many times, intentionally, misinformation is spread through various economic and political channels that our self-reliance drive will ultimately lead to lower technological levels, less efficient goods and services for the countrymen.

Law must play the balancing role to ensure that our technological growth can continue in planned manner without any legal interference or unfair practice by any party with vested interest, domestic or foreign.

With the revolutionary advancements in the fields of infor-

mation technology, communications, transportation and travel coupled with good international network of banking and financial services, the markets and economies of most of the world countries are becoming more closely linked with each other. Gains of one country may lead to certain loss for other country. Therefore, industrially developed countries are trying to make laws and treaties to suit their national interests and priorities, instead of working for win-win partnership.

Can we be the passive witness to the situation?

V. Restrictive/Discriminatory Laws by Developed Countries

Many developed countries have made laws to restrict/deny export of certain class of state-of-the-art goods and technologies, in selective manner, to developing countries. Our country has faced such technology denial measures adopted by certain western countries. When our laboratories needed certain type of alloy steel to develop indigenous defence systems, western countries imposed ban on export of such alloy steel to India. We could not import vital raw-material, but could get the ready-built full system from those countries. As soon as we succeeded in the development of that particular alloy steel, the ban on export of that steel was lifted.

Let me narrate to you an event that took place in 1986. Our scientists in Defence Research and Development Organisation (DRDO) needed a super computer for fast design of missiles and aircraft. Defence needed a CRAY class super computer. At that time CRAY-XMP super computer had 55 Mega-FLOPS capability

(equivalent to 195 M-TOPS.) The then Scientific Adviser to Raksha Mantri and myself visited Pentagon in USA to get clearance for sale of CRAY-XMP computer. After a few days of the visit, Pentagon refused sale of this computer to DRDO. Similar refusal took place in case of CRAY super computer needed by Indian Institute of Science, Bangalore. These refusals triggered the minds of Indian Scientists to meet this challenge. DRDO established an exclusive facility for development of fast processing computer. In 3 years time, we developed a super computer of a class better than the CRAY-XMP. Thanks for their refusals, we have already developed and installed indigenous super computer of 1800 Mega FLOPS capability (as compared to 55 mega FLOPS capability of CRAY-XMP). There are multiple agencies for development and production of this class of super computer in India. Today the same super computer company is trying to establish a company in India. We cannot allow our country to be used as backyard for developed countries' unwanted collapsing industries.

VI. Impact of National Laws on International Equations

The post World War-II saw steady escalation of cold war tensions and a vigorous use of UN Security Council forum where the two superpowers used the 'veto power' to protect their respective interests, friends and allies. A predictable state of bi-polar world order was getting established with the UN Forum providing the necessary platform for maintaining a sense of balance between the nation states of the world. The discriminatory or re-

strictive laws of the western block of developed nations justified on the basis of denial of technology to the enemy. However, after the collapse of the Soviet Union this east-west axis has taken a north-south orientation and the export controls and technology denial regimes now are directed mainly to the developing nations including India, to maintain the techno-economic superiority of the advanced countries.

In strategic or military technology areas, discriminatory laws have existed since the COCOM export control regime operative from the early 1950s and the establishment of NPT in 1968. In 1987, seven advanced nations secretly formed the infamous MTCR which is not even an international treaty. In 1995, the US and other powerful Nuclear Weapon States (NWS) steamrolled the indefinite extension of the NPT, thereby perpetuating nuclear apartheid. The world has also silently witnessed the discriminatory use of MTCR against fast developing nations like India, that are not subservient to the superpower-power block. The US hard line against Indian space agency for the cryogenic technology contract from Russia should be contrasted with their soft line on the transfer of "M-11" missiles from China to Pakistan. Similarly, US inability to take any action against the clandestine nuclear technology co-operation between China and Pakistan is another example of how 'non-proliferation' concerns are subjectively oriented to the proliferating state's power status.

We thus have a situation where the national laws and legislations of the powerful nations have come to dictate the interna-

tional norms and behaviour. The present CTBT being signed at U.N. Headquarters is a glaring example of how five nuclear weapon countries can steam-roll the agenda of an international treaty of far-reaching consequence. When India first proposed CTBT in the 1950s as a step towards total nuclear disarmament, US was totally against it. Now, the same CTBT is being blatantly used to serve the non-proliferation agenda of the NWS with total disregard to either the original nuclear disarmament goals or to the legitimate security compulsions of India. The twin standards of international equations are fast becoming an accepted way of life even though they invariably compromise the interests of the developing countries. The lawyers in the developing countries should come together to see how the UN forums can be strengthened and made more responsive to the needs of the developing countries. Sooner we reduce the disparities among the nations, sooner we can hope to achieve some semblance of world peace and harmony.

VII. Our Laws to Suit our National Priorities

Law, technologies and nation's priorities are interdependent and have triangular relationship. Laws must protect the indigenous technologies and trade. Many of our laws were framed on the basis of similar laws already in force in the colonising countries — in our case Britain. Those laws had been framed keeping in view their particular societal and industrial structure. There is need to frame our laws to suit the Indian environment so as to be able to solve our specific problems and to accelerate the overall developments of the nation. We need to frame the special laws in areas of economic growth, trade and technological developments.

Signing of international Trade Treaties, which has brought the WTO into being, has also brought certain challenges and opportunities which have to be evolved by our Law. India, as a signatory to the agreement, is under obligation to amend the Patent Laws to bring in conformity with the laws of the western countries who are at the moment sitting at the height of technological advancement. India is a signatory to the Washington Treaty on Integrated Circuits but is yet to frame laws in this field. The TRIPs agreement also makes it obligatory for the member countries to frame laws for intellectual property protection of genetically modified micro-organism and micro-biological processes. Similarly TRIPs agreement warrants the member countries to develop their own (*sui-generis*) system by year 2005, for protection of new, distinct and stable varieties of plants. These are the fields which have to be researched and laws have to be framed in the near foreseeable future to meet the international obligations under the TRIPs.

Concluding Remarks

Friends, in this world we have two categories of nations. Five nuclear weapon states and rest non-nuclear countries. The right doctrine in this turbulent world is : Strength respects strength. Technology is the wealth generator and provides strength in economic fields as well as in the national security.

Young lawyers have therefore, challenging responsibilities to uphold the rule of law and also to frame the laws in the emerging new fields. Such laws should be framed and used as instrument for development of society, prosperity of the people and for the overall progress of a strong nation.

CAMPUS NEWS

Mumbai IIT Tie-up with US Firm

The aerospace engineering department of the Indian Institute of Technology (IIT), Powai, has entered into an agreement with American aerospace organisation, United Technologies which manages Pratt and Whitney, the makers of jet engines. Pratt and Whitney engines are used to power U.S. fighters like the F-15, the F-16 and also the F-22 now being developed for the U.S. Air Force. They are also used on civil aircraft.

The understanding between the two is to "develop new computer models for the study of jet engine efficiency".

IIT Director Prof. S.P. Sukhatme, said that the agreement would prove immensely beneficial to aero-space students. "Post-graduate students could now be involved in a more 'live' programme", he said and added "We look forward to that kind of collaboration".

Head of the IIT's aerospace engineering department Professor Srinivasan Suryanarayanan said, "The collaboration will provide the much-needed incentive to aerospace students to broaden their research work". He said that the understanding has been reached at a time when various doctoral programmes in engineering and technology have not been able to evoke an enthusiastic response, particularly from bright students for various reasons.

Dean of research and development at IIT Prof. Narayan Murthy said that the link up between IIT's aerospace engineer-

ing department and the American engine manufacturer will benefit post graduate students in four ways. These were (a) it will attract a higher quality of post graduate students for research programmes; (b) it will help in upgrading the aerospace engineering faculty by providing access to better facilities; (c) it will further strengthen the 'goal-oriented research' as the programmes undertaken by students will have some bearing on future projects; and (d) overall it will enhance the capabilities of the aerospace engineering department.

According to US firm the programmes "recognise the outstanding expertise available in the aerospace engineering department at Mumbai IIT".

Mr. Jothi Purshotaman, Senior vice-president, Pratt and Whitney said, "This task is one which requires the skills and capabilities found in first class technical institutes. We hope to expand our relationship with the Indian scientific community as we pursue more efficient, cleaner and quieter aircraft".

Education and Economic Transformation

A seminar on "Interaction on Education and Economic Transformation" organised by the Indian Chamber of Commerce was recently held at Calcutta.

Referring to the Delhi Declaration of 1993 in which investment in education was considered a critical investment and al-

location of 6 per cent of the gross domestic product (GDP) was considered essential, Mr. P.R. Dasgupta, Education Secretary, emphasised that both the state and the market would have to play a complementary role to develop and promote education in the present scenario of economic transformation.

Calling education an engine of change, Mr. Madhav Rao Scindia, former Union Human Resource Development Minister, said that the basic objective of education was to refine the sensitivities of a nation. Education and economic transformation required, he said, an optimum use of human resources. "After all, socio-economic and socio-political transformation can be brought about only by education. And this alone can create within the people the fast pace of change, especially in an age when the generation gap has narrowed down to 3 to 5 years from 25 years as it used to be earlier".

Education, he said, has to create a sentiment of intervening so that no section feels isolated.

He wondered how India, with a civilization as advanced as it had could be in the state it is in now. "Five thousand years ago when the West was still trying to create fire by hitting a couple of stones, India had a great thriving civilization. Somewhere along the way something seemed to have gone wrong and we went off the path. If the level of illiteracy stays as it is, 50 per cent of the world's illiterate would remain confined to this country by year 2000. This cannot be allowed to happen because education is the base of

(Contd. on page 20)

SPREADSHEET

LITERACY IN INDIA - II

Literacy Rates - 1991

State/U.T.	General			Scheduled Castes			Scheduled Tribes		
	Persons	Male	Female	Persons	Male	Female	Persons	Male	Female
1 Andhra Pradesh	44.09	55.13	32.72	51.59	41.83	29.92	17.16	23.23	8.61
2 Arunachal Pradesh	41.59	51.43	29.69	57.27	66.25	41.42	34.45	44.00	24.94
3 Assam	32.89	61.87	43.03	53.94	63.88	42.99	49.16	58.93	30.91
4 Bihar	38.48	52.49	22.89	19.49	50.64	7.07	26.78	38.40	14.75
5 Goa	75.51	83.64	67.09	58.72	69.55	47.51	43.91	54.43	29.01
6 Gujarat	61.29	73.13	48.64	61.07	75.47	45.54	26.43	41.23	24.20
7 Haryana	55.85	69.10	40.47	39.22	52.06	24.15	-	-	-
8 Himachal Pradesh	63.86	75.36	53.17	53.20	64.98	41.02	47.09	62.74	31.18
9 Jammu & Kashmir*	-	-	-	-	-	-	-	-	-
10 Karnataka	56.04	67.26	44.34	38.06	49.69	25.95	35.01	47.95	23.57
11 Kerala	89.81	93.62	86.17	79.66	83.22	74.51	57.22	63.34	51.07
12 Madhya Pradesh	44.20	58.42	28.85	35.08	50.31	18.11	21.54	32.16	10.73
13 Maharashtra	64.87	76.36	52.52	56.46	70.45	41.59	36.79	49.09	24.03
14 Manipur	59.89	71.63	47.60	56.44	63.28	47.41	53.63	61.59	44.48
15 Meghalaya	49.10	53.12	44.85	44.27	54.56	31.19	46.71	49.78	43.63
16 Mizoram	82.27	85.61	78.60	77.91	77.54	81.35	82.71	86.66	78.70
17 Nagaland	61.63	67.62	54.75	-	-	-	60.59	66.27	54.51
18 Odisha	49.09	63.09	34.60	36.78	52.42	20.74	23.31	34.44	10.21
19 Punjab	58.51	63.66	50.41	41.09	49.02	51.03	-	-	-
20 Rajasthan	38.55	54.99	20.44	26.29	42.38	8.31	19.44	33.29	4.42
21 Sikkim	56.94	63.74	46.69	51.03	58.69	42.77	59.01	66.80	50.37
22 Tamil Nadu	62.66	72.75	51.33	46.74	58.56	34.89	27.89	33.23	20.23
23 Tripura	60.44	70.51	49.65	56.66	67.25	45.45	40.37	52.28	27.34
24 Uttar Pradesh	41.60	55.73	23.31	26.83	40.80	10.69	35.70	49.95	19.86
25 West Bengal	57.70	67.81	46.56	42.21	54.55	23.87	27.71	40.07	14.98
26 A & N Islands	73.02	78.99	65.46	-	-	-	56.62	64.16	43.74
27 Chandigarh	77.01	82.04	72.54	55.44	64.74	43.54	-	-	-
28 D & N Haveli	40.71	53.56	26.98	27.64	38.03	66.61	23.21	40.75	15.94
29 Daman & Diu	71.20	82.66	59.40	79.13	91.03	67.62	52.91	63.51	41.49
30 Delhi	75.29	82.01	66.99	57.60	69.77	43.82	-	-	-
31 Lakshadweep	81.78	90.18	72.49	-	-	-	80.31	85.50	71.72
32 Pondicherry	74.74	83.68	65.63	56.26	66.10	46.28	-	-	-
INDIA	52.21	64.13	29.29	37.41	49.91	23.76	29.60	40.65	10.19

*Census was not held in J & K.

Sources: Ministry of Human Resource Development, Annual Report 1993-94

State and Union Territories Arranged in Descending Order of Literacy Rate Among Persons, Males and Females: 1991

State/ Union Territory	Literacy Rate	State/ Union Territory	Male Literacy Rate	State/ Union Territory	Female Literacy Rate
Kerala	89.81	Kerala	93.62	Kerala	86.17
Mizoram	82.27	Lakshadweep	90.18	Mizoram	78.60
Lakshadweep	81.78	Mizoram	85.61	Lakshadweep	72.89
Chandigarh	77.01	Pondicherry	83.68	Chandigarh	72.34
Goa	75.51	Goa	83.64	Goa	67.09
Delhi	75.29	Daman & Diu	82.66	Delhi	66.99
Pondicherry	74.74	Chandigarh	82.04	Pondicherry	65.63
A & N Islands	73.02	Delhi	82.01	A & N Islands	63.46
Daman & Diu	71.20	A & N Islands	78.99	Daman & Diu	59.40
Maharashtra	64.87	Maharashtra	76.36	Nagaland	54.75
Himachal Pradesh	63.86	Himachal Pradesh	75.36	Maharashtra	52.32
Tamil Nadu	62.66	Tamil Nadu	73.75	Himachal Pradesh	52.13
Nagaland	61.63	Nagaland	73.13	Tamil Nadu	51.33
Orissa	49.09	Orissa	63.09	Punjab	50.41
Tripura	60.44	Tripura	70.51	Tripura	49.65
Manipur	59.89	Manipur	69.10	Gujarat	48.64
Jharkhand	58.51	Jharkhand	67.81	Sikkim	46.69
West Bengal	57.70	West Bengal	67.62	Sikkim	46.56
Sikkim	56.94	Karnataka	67.26	West Bengal	46.39
Sarawak	56.04	Sarawak	63.74	Meghalaya	44.85
Haryana	55.85	Punjab	63.66	Karnataka	43.34
Assam	52.19	India	64.13	Assam	43.33
India	52.21	Orissa	63.09	Haryana	40.47
Meghalaya	49.10	Assam	61.87	India	39.29
Orissa	49.09	Madhya Pradesh	58.42	Orissa	34.68
Madhya Pradesh	44.20	Uttar Pradesh	55.73	Madhya Pradesh	32.72
Andhra Pradesh	41.60	Andhra Pradesh	55.13	Arunchal Pradesh	29.69
Uttar Pradesh	41.60	Rajasthan	54.99	Madhya Pradesh	28.85
Arunchal Pradesh	41.59	D & N Haveli	53.56	D & N Haveli	26.98
D & N Haveli	40.71	Meghalaya	53.12	Uttar Pradesh	23.31
Rajasthan	38.55	Bihar	52.49	Bihar	22.39
Bihar	38.48	Arunchal Pradesh	51.45	Rajasthan	20.44

(Contd. from page 17)
socio-economic progress".

Laying special stress on the need for vocational education, he referred to the success of Indira Gandhi National Open University where an estimated 90 per cent of the students were getting the benefits of employment oriented education.

ICAR - NARC & IIMI Tie-up

The Indian Council for Agricultural Research (ICAR) and the Nepal Agricultural Research Council (NARC) are reported to have agreed on a workplan for 1997-98 for exchange of biological materials, technical information, scientists and joint training programmes.

The exchange of biological materials from Nepal to India would be in ornamental crops, garlic, potato, temperate fruits, pulses, oilseeds, cereals, fish, livestock and poultry birds. India, in turn will provide material on spices, condiments, tea, coffee, other cash crops and hormones for fisheries, animal breeding, pasture and forage seeds.

The joint training programme will be in the area of production technologies for rice, wheat, maize and millets, potato seeds production and cultivation, multiple breeding of carp fish and hatchery management, cryo preservation of animal genetic resources and watershed management in hills.

A memorandum of agreement was signed between the two organisations by Dr. R.S. Paroda, DG, ICAR and Dr. J.C. Gautam, Executive Director, NARC.

An agreement was also signed between ICAR and the International Irrigation Management Institute (IIMI), Colombo, for scientific and technical collaboration in irrigation management. The pact calls for improving agricultural production in India through scientific water management technologies by way of collaboration with IIMI in research and training.

The IIMI is one of the 16 centres of the Consultative Group on International Agricultural Research (CGIAR) and it works for the development, dissemination and adoption of lasting improvements in the performance of irrigated agriculture in developing countries.

Despite having created the world's largest irrigation potential, India has scope for improving the productivity of irrigated areas to meet future food and fibre needs. There is also need to improve management of irrigated agricultural systems to ensure efficient utilisation of irrigation water enhancement and sustainability of irrigated agricultural productivity.

The plan envisages use of improved machinery designs and techniques arising from cooperative effort for mutual benefit.

Workshop on Question Banks

A three-day 'UGC workshop on developing question banks in Botany and History' was recently held at the Women's Christian College in Chennai.

Dr. K. Christian, Principal, WCC, said a recent UGC workshop on 'Examination Reforms and Evaluation' had come up with a suggestion that a question bank could be created for 16 subjects at the undergraduate level to upgrade the standard in auton-

omous colleges. The colleges in the southern region of the UGC would prepare exhaustive objective, long and short answer questions on the comprehension and analytical abilities. The inputs to the bank would be relevant as nearly 80 per cent of the syllabi of all the colleges were similar which would facilitate creation of a uniform database for the question bank.

Dr. G. Rengasami, Head, Botany Department, and workshop coordinator said about 30 colleges had been invited and their services would be utilised to create an exhaustive question bank capable of testing the skills of students through objective type, multiple choice, short and long answer questions.

Dr. Prema Kasturi, Head, History Department, said this was the first phase of forming questions and it would be later validated and computerised for the benefit of all colleges in the second phase.

IICT Develops New Anti-Allergy Drug

The Indian Institute of Chemical Technology has developed a new anti-allergy drug through plant sources, revealed its Director, Dr. Raghavan. The new drug was developed from a herb brought from Mahabaleshwar in the Western Ghats. After intensive research the plant started showing desired results and is now kept under strict supervision. It professes to be an antidote to many diseases, more of it could be known only after the drug gets patented, said the Director.

He elaborated that Indian folklore was full of descriptions about herbs which had medicinal

value. "We have a rich tradition in the Vedic system of medicine. IICT is using those indigenous prescriptions to produce our own system of medicine", he said.

The primary aim of the institute is to concentrate on life saving drugs and make them as inexpensive as possible. The emphasis is more on our country's specific diseases and the institute is working on those drugs which have lost their resistance. With new diseases cropping up IICT is in search of new medicines and is trying to buy the manufacturing rights of some bulk-drugs to make them cost effective.

Having so far developed cost effective technology for 18 to 20 drugs which include drugs for arthritis, cardiovascular, liver improvement, the institute is currently engaged in developing medicine on amoebiasis, hepatitis, diphtheria and infection borne diseases. It has also developed an anti-malarial drug called Nafaquine.

Fellowships in Comparative Indian Literature

The K.K. Birla Foundation offers Fellowships for higher studies in the field of Comparative Indian Literature. The object of the Fellowships is to provide opportunity to eminent scholars, teachers, writers etc to undertake indepth study of serious subjects in Comparative Indian Literature, a new and growing academic discipline.

This year the Foundation has offered two Fellowships for 1996-98. The duration of the Fellowship is two years and it carries a tax free stipend of Rs. 9000/- per month with a contingency grant

of Rs. 25000/- per annum.

The recipients are Dr. J.P. Das, a well known poet, dramatist and writer and Dr. E.V. Ramakrishnan, Reader, Dept. of English, South Gujarat University, Surat. Dr. Das's subject of study will be the "Growth of the modern Indian Drama" while Dr. Ramakrishnan will undertake research on 'Narrating the Nation: A comparative study of some of the fictional works written in Malayalam, Kannada, Marathi, Gujarati and Hindi during the period 1960-90".

Urdu Varsity at Hyderabad

The Rajya Sabha recently passed the Maulana Azad National Urdu University Bill, 1995, seeking to establish and incorporate a university at the national level mainly to promote and develop Urdu language.

According to the Human Resource Development Minister, Mr. S.R. Bommai the proposed university would impart vocational and technical education in Urdu medium through conventional teaching and distance education system. He said the university would go a long way in meeting the demand of Urdu-speaking minority in the country.

Mr. Bommai said it had been

decided to set up the university at Hyderabad keeping in mind the large number of Urdu-speaking people there.

NAAS Fellowships

Four scientists of the Punjab Agricultural University (PAU) have been selected for the National Academy of Agricultural Sciences (NAAS) fellowships for 1997.

The scientists to receive the highest academic distinction in agriculture in the country are Dr. G.S. Nanda, Professor of Plant Breeding, Dr. Kashmira Singh Sekhon, Professor in Department of Food Science and Technology, Dr. V.K. Nayyar, Senior Soil Chemist and Dr. Surinder Kumar Jalota, Senior Soil Physicist.

Award for JNU VC

Prof. Asis Datta, Vice-Chancellor, Jawaharlal Nehru University, has been selected by the Third World Academy of Sciences (TWAS), Italy for its prestigious award in biology for 1996. Professor Datta, who teaches molecular biology and biochemistry at JNU, will share the award with Prof. Juan Carlos Castilla from Chile. It will be presented to him on the occasion of the sixth general conference of the TWAS to be held in Rio De Janeiro, Brazil, in September, 1997.

News from Agricultural Universities

International Conference on Sustainable Agriculture

An International Conference on Sustainable Agriculture was recently organised at the Chaudhary Charan Singh Haryana Agricultural University (CCS HAU) to discuss appropri-

ate technologies and farming systems for enhancing present levels of agricultural production and review the current status of research on sustainable crop production in fragile environments.

Inaugurating the conference Dr. J.S.P. Yadav, former Chairman of Agriculture Scientist Recruitment Board said that sustainability of intensive agriculture system which was being followed since green revolution period, had become a major global concern especially in the context of fast swelling population. He said that due to population explosion, industrialisation and other developmental programmes the pressure on cultivable land had been increasing at an alarming rate, threatening agricultural production and its sustainability. He said that situation was more grim in the fragile environments where lands were hostile to agricultural production either due to topographic features or human induced factors.

Talking about India's agricultural scenarios, Dr. Yadav said that although it ranked first in the world in net cultivated area, second in irrigated land, third in fertilizer consumption and adoption of high yielding crop varieties, yet the yield levels of many crops were lowest, mainly because of poor use of inputs and degradation of soil and water resources. He further said that by the year 2025, nearly 25 per cent more good quality water would be polluted which would have direct bearing on agriculture production.

Dr. Yadav called upon the agricultural scientists to focus on developing technologies and sustainable systems that apart from interacting synergistically with local biophysical and socio-economic environment were economically viable and ecologically sustainable in the long run.

Prof. J.B. Chowdhury, Vice-Chancellor, who presided, focused on the poor crop produc-

tion in rainfed regions. He said that the main spurt in the production had been in irrigated regions, that too in wheat and rice crops whereas, the performance of pulses, oilseeds and coarse cereals which were mainly cultivated in rainfed areas that constituted 70 percent of the net cultivated land, had remained rather poor. The situation was also none the different in salt affected regions, he said.

He urged the scientists to explore the biotechnological techniques and suggest crop-climate combinations for enhancing the present crop productivity levels and stabilizing the production trends in fragile environments.

The agricultural scientists who participated in the conference stressed on creating competitiveness in agricultural research for further improvement in the quality of research in India. They said that India like China should provide matching initiative research funds, to attract private sector for linkage in various fields of research. The scientists also emphasized that technology for low input agriculture needed to be developed. This will, they opined, easily percolate to the

poverty prone areas in the country.

The Canadian scientists also observed that the benefits of green revolution in India had not reached the people living under fragile environments, mainly because priority had not been given to researches relevant to those areas. They said that technology mission for fragile areas be framed and funds allocated to dryland agriculture research.

According to Dr. D.P. Singh, Chairman of the Organising Committee, over 30 scientists presented research papers. The topics included bio-technology, post harvest technology, diversified agriculture, fruits and vegetable processing and technology for different stress conditions. Besides conducting technical sessions on varied topics, a panel discussion on public-private sector linkages was also held during the meet and an effective and viable strategy to mitigate the problems of sustainable agricultural production in fragile environments in the international perspective was chalked out.

The four-day conference which was attended by experts from USA, Canada, Germany,

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China, Poland, Mexico, Africa, Japan, Switzerland, Austria, Finland, Denmark, Spain, France, England and India has been sponsored by the Max Mueller Bhawan, New Delhi. Its Programme Officer Ms Petra Matusache gave introduction of the theme of the conference.

Sir Chhotu Ram Memorial Lecture

Delivering Deen Bandhu Sir Chhotu Ram Memorial Lecture at Chaudhary Charan Singh Haryana Agricultural University (CCSHAU) the Governor of Sikkim, Chaudhary Randhir Singh said that the nation's output was primarily dependent on agricultural performance as agriculture was the only major sector of our economic activity which provided employment to major segment of our population besides providing food to the nation and raw material for the industries. He said that for the sustained alround development of the nation, firm agricultural base was a prerequisite.

In his lecture entitled, "Our Farming Imperatives", Chaudhary Randhir Singh described the problems faced by the small and marginal farmers and the ways and means of overcoming them for the speedy development of sustainable agriculture. He said that all out efforts should be made to promote small farmers initiatives and provide policy packages stressing groups endeavours to remain self-sufficient in food production. To feed the ever increasing population, the country must produce at least two hundred and forty million tonnes of food grains a year by 2000 AD.

Applauding the efforts of the agricultural scientists in enhancing the food production in the

country and thereby promoting the rural development, the Governor said that there were two issues that confronted agricultural scientists — one was adopting productivity path and facing problem of increasing biotic and abiotic stress on production process; the other of over exploitation of water resources, especially ground water resources. We were yet to perfect the art and science of on-farm management of water in a way that we could maximise production per cubic metre of water. New technologies being developed should be free from all built-in needs of social discrimination and from potential harm to environment, he added.

Paying humble tributes to Sir Chhotu Ram, Chaudhary Randhir Singh described him as a colossus who strode north India for over quarter of a century and liberated the rural poor from shackles of vested interests and saved them from ignominy and humiliation. He urged the agricultural scientists to work for the betterment and welfare of farming community on lines with Sir Chhotu Ram. He laid emphasis on need of commercialisation of agriculture and increasing agricultural exports. To ensure success at this front, it was necessary that agri-

cultural marketing and processing were developed so that farmers could concentrate on producing high value added crops. He said that commercialisation of agriculture and enhancement in agricultural exports would not only generate more income for farmers but also create large scale employment.

Prof. J.B. Chowdhury, Vice-Chancellor, CCSHAU conferred Sir Chhotu Ram National Award, 1995-96 on Dr. M. Mahadevappa, Vice-Chancellor, University of Agricultural Sciences, Dharwad (Karnataka) for his outstanding research in agricultural and rural development. The award carries a cash prize of Rs. 25000 and a citation.

In his presidential address, Prof. Chowdhury said that the peasantry formed the backbone of the nation and ensuring their elevation by faster and cheaper agricultural development was the sole mandate of this university. The Vice-Chancellor urged the participants who included a large number of academicians, scientists, policy planners and all those involved in rural development to work unitedly and passionately to root out degrading poverty and ignorance from the poor and down trodden section of the society.

News from UGC

Countrywide Classroom Programme

Between 23rd and 31st December, 1996 the following schedule of telecast on higher education through INSAT-ID under the auspices of the University Grants Commission will be observed. The programme is presented in two sets of one hour duration each every day from 6.00 a.m. to 7.00 a.m. and 1.00 p.m. to 2.00 p.m. The programme is available on the TV Network throughout

the country.

1st Transmission

6.00 a.m. to 7.00 a.m.

24.12.96

"Water Chemistry in Thermal Power Station - I"

"Material Testing - II"

"India an Idea"

26.12.96

"Hetrojunction Light Sources"

"Byron..Byron..Byron - I"	Technique - II"	29.12.96
"Optical Properties of Minerals in Transmitted Light - II"	24.12.96	No Telecast
28.12.96	"Rain Water Harvesting"	30.12.96
"Krien-Milman Theorem"	"ETV in Japan"	"Classical Mechanics - IV : Newton's Second Law"
"Jute - Making it Work - II"	"Ayurveda : Science of Life"	"Money"
"Evolution of Money"	25.12.96	"Sugar Science - V : Bio-fertilizers"
29.12.96	"Climatic Past at Nalsarovar"	31.12.96
"Khalid Tyabji on 'The Pool"	"The Resource Atlas of Rajasthan"	"Basics of Dairy Farming"
"Indian Stick Fighting - II"	"The Insect Eaters"	"Obesity"
"Triumph of Architecture"	26.12.96	"Human Chromosome : Abnormalities"
31.12.96	"Computer Graphics : Concepts and Applications"	Hindi Telecast
"Water Chemistry in Thermal Power Station - II"	"Rocks"	प्रातः 6.00 से 6.30 बजे तक
"Getting Ready for Magnification - I"	"A Poet with a Difference"	23.12.96
"Herbal Medicine Pharmaceuticals in India"	27.12.96	"लिटिल नॉलेज इज ए डेन्जरस थिंग - II"
Ind Transmission	"Life Cycle of Stars"	25.12.96
1.00 p.m. to 2.00 p.m.	"Sampling Techniques - I"	"हिन्दी की सामान्य त्रुटियाँ"
23.12.96	"Introduction to Sampling"	27.12.96
"Classical Mechanics - III"	"A Chance for Survival"	"बंधेज : कला इन्प्रधनुषी रंगों की"
Newton's First Law"	28.12.96	30.12.96
"Time Management : The Edge of Success"	"The Story of Indian Painting - IX : Early Pioneers of Modernism"	"श्याम सखा सूरदास : जीवन वृत एवं भवित"
Sugar Science-IV : Breeding	"Family Series : The Winds of Change - I (New Zealand)"	



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BOOK REVIEW

An Ideal Reference Book

R.D. Pathak

S. Ramnarayan & Ram Mohan Rao. Managerial Dilemmas : Cases in Organizational Behaviour. New Delhi, Tata McGraw Hill Publishing Company, 1996. Pp. xv+455. Rs. 300

In today's world of paradoxes and everlooming uncertainties, professional and managerial jobs consist of a series of decisions involving the weighing of alternatives in the context of managing the inevitable change. Education, therefore, has to provide the skills needed by the participants to face, in action, the problems arising out of the new situations in ever changing environment. Accordingly, case method holds its special place in management education and the business schools endeavour to impart to students knowledge of organisations through cases based on real-life organisations in all their complexities.

The primary concern of this book also is to enable the reader gain an understanding of organisations in action, through an exposure to real life situations, events and dilemmas encountered in them. It contains forty cases, grouped under nine sections : (i) window on organisations; (ii) individuals, in organisations; (iii) moves toward professionalisation; (iv) learning and entrepreneurship; (v) organi-

sational design; (vi) organisational processes; (vii) leadership and institution building; (viii) organisational rejuvenation and change; and (ix) the first person account of chief executives.

What makes this book stand apart from other similar books is a well thought out grouping of above nine sections where each section contains an excellent introductory exposition on theoretical issues and concepts necessary to understand and appreciate the background context of cases. It helps the teacher as well as the student to fully make use of this book as an ideal reference book for the subject of Organisational Behaviour where the reader is guided through the underlying concepts and theories using updated standard reference works. The following cases in each section, selected very judiciously, then provide a focus for detailed discussions on relevant issues underlying each case through raising pertinent questions. For example, Section I contains three cases that provide different glimpses of organisations rich in their diversity as well as complexity and capable of generating, thereby, the much needed insight into their functioning through critical analysis and appreciation of their functioning in different settings. Hence, the appropriate titling of this section as 'Window

on Organizations. In Section II, four cases focus on the central role the individual plays in organisations and need for a holistic approach to understand and appreciate the interdependencies between the individual and the organisation. Section III of the book focuses the attention of reader on the problems and complications arising from attempts at professionalisation of management in family-run enterprises in the present day context of swiftly changing external environment and increasing competitiveness. Subsequent section i.e Section IV of the book reminds the reader that the risk-taking ability alone is not enough to sustain the organisation in the long run. Therefore, four cases in this section make one appreciate that the organisation would have to imbibe the entrepreneurial spirit and combine it with enduring strategies, structure and processes, which is feasible only when the organisation remains a learning system, processing information and insights into its internal as well as external challenges and opportunities. This is where the need for next section of the book arises i.e Section V on organisational design where through four cases, authors help us to explore various organisational design choices through case example of such well known organisation like Hindustan Lever. The focus here is on the changing environment and the organisational efforts to bring about greater coherence between the business, the market place and the organisational structure. Section VI of the book takes us from organisation design choices to

*Senior Professor & Chairman of School of Defence & Management Studies & DEAN of Faculty of Management Studies, IMS, Devi Ahilya University, Indore-452 001.

Organisational processes emphasizing that it is only the organisational learning and renewal that lies at the heart of a firm's ability to live in harmony with the environment over a longer period of time rather than staying with a particular organisational design choice alone i.e. the organisation cannot take readaptation, renewal and revitalisation for granted, but on the contrary, has to find the right environmental domain, communicate common goal to employees, specialise to cope with the environment, ensure coordination across individuals and departments, and use appropriate approaches for human resource development. Accordingly, the next section of the book i.e Section VII focuses on leadership and institution building. All the four leaders, around whom the cases are woven in this section, are an example of outstanding leadership who were instrumental in building, nurturing and imbuing' with an inspiring vision. Authors have also in this section drawn attention to the distinction between 'Management' and 'Leadership'. Quoting Kotter, they maintain that while management is about coping with complexity, leadership is about coping with change. Hence, Section VIII of the book, through six cases, focuses on different facets of organisational change and renewal, particularly, change with continuity that empowers an organisation to deal successfully with its environment. All the six cases in this section provide a good account of how organisations have dealt with change (and also in some cases how they got plunged into a state of sickness and dramatically turned around) and the role of

management & leadership in the handling of complexity and change process. As it will be no more than a platitude to say that the chief executive have a profound influence on the organisation, therefore, the last section of this book i.e. Section IX aptly epitomises this role of Chief Executive through the first person accounts of five celebrated chief executives which makes this section a most valuable reading for the readers making them appreciate how the fortunes of organisations go up or down with the kind of leadership at the top level.

This book is, undoubtedly, a most welcome addition to the existing literature on Organisational Behaviour. The uniqueness lies in well selected Indian cases and providing a case index at the end of the book giving an outline of each case, and an updated succinct introduction to

each section of the book, thereby, serving as a stimulus for further necessary background readings. This valuable book could be further supplemented by bringing out separately an instructor's manual for the cases presented in the book as "Notes for the facilitator." i.e. suggestions for using the case study in different ways with different focus questions and different alternatives alongwith a summary of the actual actions that were taken in the concerned organisation in the case and the results as well as what other facilitators have tried and what happened or alternatives that worked or did not work etc. This work does fulfil the expectations that appropriate reading material for imparting management education based on appreciation of our particular social-political-economic context be available which, in turn, will stimulate further efforts in this direction.

A Worthy Addition

F. K. D. G. P.

C.K. Degaonkar

J. Satyanarayana. *The New Industrial Policy and its Impact on Indian Industrial Economy*. Hyderabad, Booklinks Corporation, 1996. Pp. xii.+136. Rs. 200.

The new economic policy, introduced in 1991 was a major breakthrough in Indian economic policy since 1951. Obviously, it has attracted the attention of researchers and academicians. As a result, a lot of economic literature is coming forth to provide adequate knowledge about the policy to the masses and to review the impact of the policy on the economy in the short period. The book

under review is also an outcome of research carried out by J. Satyanarayana where he deals with the new industrial policy in particular and its impact on India's industrial economy.

In the first part of the book, the author gives a comprehensive account of the industrial development in India from 1951 to 1991. i.e during the planning and regulation era. This informs the reader about the background in which the new policy was shaped. It was not conducive to promote a harmonious, balanced and efficient

*Department of Economics,
Gulbarga University,
Gulbarga-585 106.

pattern of industrialisation in the country. On the other hand, it led the economy towards inefficiency, high costs, concentration and inflation. The growth of public sector is analysed with the help of variables like, share in total investment, capital, output employment etc, and it is established that the growth was characterised by excess capacity, surplus manpower, low productivity and losses. On the other hand, the private sector could not develop on account of excessive regulation and over protection. Citing references from the reports of various committees, Satyanarayana argues that, the licensing system along with MRTP Act came in the way of attaining optimal size and promoting competition. The overall performance in industrial field was low growth rate, low rate of industrial production, high costs and inefficiency. The author observes that, the nexus between owner, labour and the politicians led to sharing of gains between, these parties at the cost of the consumer. All these led to growing fiscal deficits, deficits in foreign trade and growing subsidies contributing to the crisis of 1991. The efforts put in establishing these conclusions by the author are noteworthy. It is a scientific analysis based on adequate statistical data.

The part II of the book deals with the issue, reflected in the title of the book. The detailed text of the New Industrial policy is given in Annexure. While evaluating the impact of new economic policy at the macro level, the author feels that the policy in initial years was less successful as the fiscal deficits could not decline and the inflation was not brought under control. This again is attributed to growing interest costs,

losses of public enterprises and also those of state electricity boards. The impact of new industrial policy on industrial development is mixed. The index of industrial production has increased. The profitability of private sector has increased, but he feels that this is due to external factors than improvement in internal efficiency. The public sector continues to dominate the industrial field. With regard to foreign investments, the picture is not favourable. The indiscriminate entry of foreign capital in any sector even in cool drinks/beverages etc is not desirable. The author gives a hint about future consequences through citing an ex-

ample from Chile. He also concludes that the new policy has not favoured the labour and the poor class.

The book is a worthy addition to economic literature. It reflects a scholarly approach. A more detailed major industry-wise analysis would have increased the utility of the book. However the author has rightly indicated the trends generated and has not framed any definite conclusions because the policy is in operation for a short period. Overall the book is useful to all those who are interested in enhancing their knowledge about the industrial economy of India.

DR. YASHWANT SINGH PARMAR UNIVERSITY OF HORTICULTURE & FORESTRY NAUNI (SOLAN) H.P. ADMISSION NOTICE

Applications are invited for admission to Doctoral Programme to fill up some seats in the following subjects for the Academic Session, 1996-97 commencing from 17.1.1997.

COLLEGE OF HORTICULTURE

Pomology, Vegetable Crops, Fruit Breeding & Genetic Resources, Entomology and Apiculture, Mycology and Plant Pathology, Post Harvest Technology, Biotechnology and Floriculture & Landscaping.

COLLEGE OF FORESTRY

Tree Genetic Resources & Improvement, Silviculture, Agroforestry, Forest Products, Soil & Water Management and Social Sciences (Agriculture Economics)

Minimum Qualifications/Fellowship/Stipends/Reservation of Seats

As per details in the University Prospectus, Prospectus alongwith application form can be had from the Registrar, Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Nauni (Solan) HP 173230 on payment of Rs. 50/- in cash at counter or by sending bank draft worth Rs. 60/- payable to the Comptroller of this University.

Last Date for Receipt of Application : 18.1.1997

Date for Written Qualifying Test : 13.1.1997

Date of Interview

i) College of Horticulture	: 14.1.1997 (11.00 AM to 1.00 PM)
ii) College of Forestry	: 14.1.1997 (2.00 PM to 5.00 PM)

Note : i) The candidates seeking admission must attach copies of all the requisite certificates duly attested by the competent authority with the admission form. They should also bring original certificates at the time of interview.
 ii) No separate interview letter will be issued.
 iii) No T.A./D.A. is admissible.

S.C. Negi
REGISTRAR

THESES OF THE MONTH

A list of doctoral theses accepted by Indian Universities

AGRICULTURAL AND VETERINARY SCIENCES

Agricultural Chemistry

1. Ghatol, Siddharth Gopalrao. Studies on nature, extent, characteristics and reclaimability classification of different problematic soils of vidarbha using an integrated approach of remote sensing and conventional techniques. Dr. Parjabrao.

Agricultural Entomology

1. Badgire, Udhav Salbaji. Management of some important insect pests on groundnut. Marathwada Krishi. Dr S N Puri, Director, NCIPM, New Delhi.

2. Bhosle, Balaji Bhagwanrao. Studies on root-knot of okra (*Abelmoschus esculentus* (L) moench) caused by meloidogine incognita (Kofoid and white) chitwood. Marathwada Krishi. Dr S N Puri, Director, NCIPM, New Delhi.

3. Mokat, Ramakant Baburao. An approach to pest management studies of pod borer complex on pigeonpeas. Marathwada Krishi. Dr A D Deshpande, Professor of Entomology (Rtd.) College of Agriculture, Marathwada Agricultural University, Parbhani.

Agriculture

1. Kachhave, Kishan Gunaji. Monitoring and assessment of nitrogen requirement of wheat by soil and plant N status. Marathwada Krishi. Dr C P Ghonsikar, Asso. Director (Rtd), NARP, Aurangabad.

2. Shinde, Jaiprakash Shivram. Characterization, classification and management of salt affected soils under purna command area. Marathwada Krishi. G U Malewar, Head, Department of Chemistry and Soil Science, Marathwada Agricultural University, Parbhani.

3. Yengade, Pandurang Waghaji. Studies on growth, yield and quality of sunflower (*Helianthus annuus* L.) as influenced by different levels of phosphorus and sulphur with and without PSB (Biophos). Marathwada Krishi. Dr C P Ghonsikar, Asso. Director (Rtd.) NARP, Aurangabad.

Agronomy

1. Pawan Kumar. Soil moisture and fertility management in rainfed wheat succeeding maize. HP. Dr H L Sharma.

2. Premi, Om Parkash. Production and quality of herbage from natural grassland as influenced by the introduction of improved grass, legume and tree species. HP Krishi. Dr B R Sood.

3. Rameshwar Kumar. Studies on yield maximization and economization of inputs through organic manuring and fertilizer scheduling in rainfed maize-wheat system. HP. Dr C M Singh.

Fisheries

1. Nagoorneean, M. Problems and prospects of shrimp farming in selected districts of Tamil Nadu. TN Vet. Dr M J Prince Jeyaseelan, Professor and Head, Department of Agriculture, Fisheries College and Research Institute, Tuticorin.

Psychology

1. Singh, Narinder Pal. Studies on the diagnosis and recommendation integrated system (DRIS) norms for apple (*Malus domestica* borkh.) cv. starking delicious in H.P. YS Parmar. Dr R P Awasthi.

BIOLOGICAL SCIENCES

Biochemistry

1. Syiem, Donkupar. Developmental regulation of chicken inorganic pyrophosphatase. NEHU. Dr Ramesh Sharma.

2. Khajuria, Annu. Mechanism of action of piperine-A bioavailability enhancer. Jammu. Dr Usha Zutshi.

3. Khundmiri, Syed Jalal. Structure and transport functions of renal proximal tubular membranes in ischemia induced acute renal failure. AMU. Dr A N K Yusufi, Aligarh Muslim University, Aligarh.

4. Murthy, S. Narasimha. Studies on the enzymatic conversion of L. Lyssine to pipecolic acid: Identification of L. amino acid oxidase in mouse brain. Osmania. Dr M K Janardana Sarma, Assistant Director, N.I.N. Tarnaka, Hyderabad.

Biology

1. Bansal, Anil Kumar. Effect of nitrosamines on lipid peroxidation and antioxygenic mechanisms in Albino Rat. Devi Ahilya. Dr Deepak Bhatnagar, Department of Biology, Devi Ahilya Vishwavidyalaya, Indore.

2. Celestina, Francina. Characterisation and nucleic acid binding properties of a helix stabilising nucleoid associated DNA binding protein HSNP-C' from the thermoacidophilic archaeon *Sulfolobus scindocaldarius*. Hyderabad. Prof T Suryanarayana.

3. Karuna, Sri Kosuri. Nuclear-plastidic interactions in *Pennisetum glaucum* (L.) R. Br: Regulation of chlorophyll biosynthesis, gene expression and organisation. Hyderabad. Prof N C Subrahmanyam.

4. Rattan, Madanlal Parveen. Ecobiology of pearl spot (*Etroplus suratensis*, Bloch) in Goa water. Goa. Dr A H Parulekar.

5. Reddy, Vaka Subba. Anthocyanin biosynthetic pathway in rice (*Oryza sativa*): UV-B-Response, molecular cloning and characterization of dihydroflavonol reductase and anthocyanidin synthase cDNAs. Hyderabad. Prof A R Reddy.

6. Singh, Prem Prakash. Iodine activation, peripheral conversion of thyroxine to triiodothyronine and biological alteration in thyroid follicular membranes with special reference to temperature in *Columba livia*. Devi Ahilya. Dr Anand Kar, Department of Biology, Devi Ahilya Vishwavidyalaya Indore.

7. Sonaye, Bhagat Singh H. Exafs studies of some biomolecules (some investigation on X-rays, K-absorption edge structure. Goa. Dr P R Serode.

8. Srinivas, Rampalli. Characterisation of ribosomes from

the thermoscidophilic archaeon *sulfolobus acidocaldarius*. Hyderabad. Prof T Suryanarayana.

Biotechnology

1. Krishna C. Microbial enzyme production utilizing banana wastes. Cochin. Dr M Chandrasekharan, Reader, Department of Biotechnology, Cochin University of Science and Technology, Kochi.

2. Mohanan, P.V. Thermostable alpha amylase production by *bacillus coagulans*. Cochin. Dr M Chandrasekharan, Reader, Department of Biotechnology, Cochin University of Science and Technology, Kochi.

Botany

1. Barve, Yoganand Yeshwant. Studies on storage fungi associated with seeds of some leguminous crops. Nagpur. Dr R P Thakre, Reader and Head, Post Graduate Department of Botany, Nagpur University, Nagpur.

2. Bassi, Raman. Some physiological aspects of uptake and accumulation of zinc and copper by common duckweed (*Lemna mince L.*). HP.

3. Bhale, Usha. Studies on leaf spot and fruit rot of chilli (*Capicum annum L.*) incited by *alternaria alternata* (fries) keissler. Rani Durgavati. Dr P D Agrawal, Department of Botany, Government Science College, Jabalpur.

4. Bhadane, Vijay Vasudeo. Morphological studies in some Geraniales. DBA Marathwada. Dr N P Vaikos, Botany Department, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

5. Jayasree, N. Tissue culture studies in a rose species *Rosa hybrida L. Cv kings ransom*. Osmania. Dr (Mrs) B Prathibha Devi, Reader, Department of Botany, Osmania University, Hyderabad.

6. Md., Hamid. Ecological study of wastelands of Bihar Sharif. Magadh. Dr D D Pandey, Department of Botany, S.P.M. College, Udaipur, Biharsharif (Nalanda).

7. Patil, I.G. Studies on pollen abortion in cyte plasmic male sterile (cms) lines of *raphanus sativus L* and *pennisetum typhoides* staph-et-hubb a histochemical analysis. Karnataka. Dr C K Sudramuniappa, Department of Botany, Karnataka University, Dharwad.

8. Ramla R. Seed and seedling morphology of genus *phyllanthus* (Euphorbiaceae) of Kerala state in relation to taxonomy. Calicut. Dr Philip Mathew, Department of Botany, University of Calicut, Calicut.

9. Rao, A. Narasimha. Experimental studies in pithophora species. Kakatiya. Professor Vidyavati, Department of Botany, Kakatiya University, Warangal.

10. Sharma, Narender. Studies on a thermophilic bacterial strain and utilization of dairy waste. HP.

11. Singh, Laikangbam Nongdren Khomba. Studies on the fungi associated with rice collar rot in Manipur. Manipur. Dr N Iboton Singh, Department of Plant Pathology, Central Agricultural University, Iroishemba, Imphal.

12. Sinha, Arvind Prasad. Ecological studies of *Eleusine*

coracana (Linn.) gaertn from Biharsharif. Magadh. Dr D D Pandey, Reader in Botany, S.P.M. College, Udaipur, Biharsharif (Nalanda).

13. Vijayakumar, S. Studies on waters borne fungi of Uttara Kannada region. Karnatak. Dr Ch Ramesh, Department of Botany, Karnatak University, Dharwad.

Marine Science

1. Geetha, P. Indian and Antarctic bryozoans taxonomy and observations on toxicology. Cochin. Dr N Ravindranath Menon, Director, School of Marine Sciences, Cochin University of Science and Technology, Cochin.

2. Parameswaran, P.S. Secondary metabolites of marine organisms from the Indian Ocean Area. Goa. Dr S Y Kamat.

3. Sunil Kumar K.V. Some aspects of oceanic variability in the upper layers of the Bay of Bengal. Cochin. Dr A V S Murthy, Principal Scientist (Retd.), Centre for Marine Fisheries Research Institute, Cochin.

Microbiology

1. Meahram, Vinendra Govindrao. Biological management of groundnut root rot caused by *sclerotium rolfsii* (Sacc.). Nagpur. Dr S U Meahram, Reader, Department of Microbiology, Nagpur University, Nagpur.

Zoology

1. Bazigah Heal. Physiological and biochemical studies on chemically induced toxicity in the myocardium of aging rats. Bangalore. Dr Nayeemunnisa.

2. Bhaskar, M. Subrahmanyam. Some studies on the DNA damage and cell death in aging rat brain cells. Hyderabad. Prof K Subba Rao.

3. Bhattacharya, Nilima. Studies on insects haemocytes in normal and stressed conditions. Burdwan. Dr Subrata Roy, Department of Zoology, Burdwan University, Burdwan.

4. Bhattacharya, Sangita. Some ultra structural, histochemical and biochemical aspects of the trematode parasite, *ceylonocotyle scolicoeculum* of the gastrointestinal tract of goat, *Capra Capra*. Burdwan. Dr G Majundar, Department of Zoology, Burdwan University, Burdwan.

5. Choudhury, Sumana. Influence of superoxide dismutase on chromosome aberrations induced by a mutagen in mammalian cells. NEHU. Dr A Chatterjee.

6. Jadhav, Sham Sampatrao. Biosystematic studies of some cestode parasites from *capra hircus* at Beed District. DBA Marathwada. Dr B V Jadhav, Department of Zoology, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

7. Jayson, E. A. Synecological and behavioural studies on certain species of forest birds. Calicut. Dr D N Mathew, Department of Zoology, University of Calicut, Calicut.

8. Jharna Pal. On the correlation between some biotic/abiotic factors and the collembolan and ecarine mesofauna of a deciduous forest at Jangal Mahal, Burdwan. Burdwan. Dr D K Choudhury, Professor of Zoology, Burdwan University, Burdwan.

9. Kale, Sanjay Sadashivrao. Biosystematic study of cas-

tode parasites of birds and reptiles from Ausa Region. DBA Marathwada. Dr B V Jadhav, Department of Zoology, Dr Babasaheb Ambedkar Marathwada University, Aurangabad.

10. Kapoor, Leena. Chromosome studies on ephids from Himachal Pradesh. HP.

11. Kundu, Braja Gopal. Studies on taxonomy and ecology of soil oribatid mites (Acaria) in some areas of West Bengal. Burdwan. Prof Subrata Roy, Department of Zoology, Burdwan University, Burdwan.

12. Mahaboobunnisa. Role of pepsinogen, certain other physiological markers and helicobacter pylori in the pathogenesis of peptic ulcer. Osmania. Dr C M Hebibullah, Department of Gastroenterology, Osmania General Hospital Hyderabad.

13. Majumdar, Abhijit. Investigation of the faunistics and ecology of hironomid communities of the mangrove ecosystem of West Bengal (Diptera: Chironomidae). Burdwan. Dr P K Chaudhuri, Department of Zoology, Burdwan University, Burdwan.

14. Methur, Jyothsna. Alteration in the protein metabolism and haematological indices in golden hamsters, mesocricetus auratus pertaining to a nematode encylostoma ceylanicum infection. Osmania. Dr Mrs Aruna Karemungikar, V.V. College, Hyderabad.

15. Meera P. Coenotic and distributional pattern studies of helminth fauna from Calotes versicolor. Kakatiya.

16. Nair, Shikha. Effects of carbaryl on the midgut of the sixth instar larva and pupa of the moth spodoptera mauritia boisduval. Calicut. Dr U V K Mohammed, Professor, Department of Zoology, University of Calicut, Calicut.

17. Padma Sri, Rajani. Emendations in the carbohydrate and lipid metabolism of golden hamsters, mesocricetus auratus pertaining to a nematode, Ancylostoma ceylanicum infection. Osmania. Dr Mrs Aruna Karemungikar, V. V. College, Hyderabad.

18. Pramod P. Ecological studies of the bird community of silent valley and neighbouring forests. Calicut. Dr D N Mathew, Professor, Department of Zoology, University of Calicut, Calicut.

EARTH SYSTEM SCIENCES

Environmental Sciences

1. Reddy, Mallu Venkata. Studies on water quality deterioration in coal mining areas of some Indian coalfields. ISM. Prof Gurdeep Singh, Indian School of Mines, Dhanbad.

Geochemistry

1. Reddy, L. Siddi Ram. Geochemistry and petrogenesis of ultramafic rocks of central part of veligalu greenstone belt, Ananthapur-Cuddapah Districts, A.P. India. Osmania. Prof K Suryaprakash Rao.

Geology

1. Rao, Ananth Kumar. Hydrogeological and hydrogeochemical studies of Sitanadi basin in Dakshina Kannada District, Karnataka (India). Bangalore. Dr C Naganna.

2. Saha, Tapan Kumar. Studies on the coking characteristics of Indian coals to be used in metallurgical purposes.

Burdwan. Prof S B Bhattacharya, Department of Geology, Regional Engineering College, Durgapur and Prof S N Ghosh, Department of Chemical Engineering, Regional Engineering College, Durgapur.

3. Sandeep Kumar. Stratigraphic and facies evaluation of middle and upper siwalik sequence in Jammu Himalaya. Jammu. Dr G M Bhat.

4. Sharma, V. Nagasai. Petrological and geochemical studies on the Gabbro - syenite complex of Chanduluru Prakasam Province, Andhra Pradesh, India. Osmania. Dr J Ratnakar, Reader, Department of Geology, Post Graduate College of Science, Osmania University, Hyderabad.

Geophysics

1. Sastry, R. Sivarajna. Physical modelling and field studies on resistivity and induced polarisation method in mining geophysics. Osmania. Dr A Appa Rao, Scientist, NGRI Hyderabad.

ENGINEERING SCIENCES

Civil Engineering

1. Rakesh Kumar. Development of catalytic convertor for control for automobiles exhaust. Nagpur. Dr P Khanna, Director, National Environmental Engineering Research Institute, Nagpur.

Mechanical Engineering

1. Venkatesh, J.V.L. Purchase lot sizing considering seasonal fluctuations in demand in a material requirements planning system. Nagpur. Dr R D Askhedkar, Professor in Industrial Engineering, V.R.C.E., Nagpur.

Technology

1. Pillai, V. Bhoothalingam. Studies on interpenetrating polymer networks based on hydroxyl terminated natural rubber. Cochin. Dr D Joseph Francis, Professor, Department of Polymer Science and Rubber Technology, Cochin University of Science and Technology, Kochi.

2. Thomas, Tessamuna. A modified block adaptive predictive coder for speech processing. Cochin. Dr C S Sridhar, Professor, Department of Electronics, Cochin University of Science and Technology, Kochi.

PHYSICAL SCIENCES

Chemistry

1. Banerjee, Debasish. A spectroscopic investigation of solvation of ground and electronically excited states of molecules in various environments. Burdwan. Dr S Bagchi, Department of Chemistry, Burdwan University, Burdwan.

2. Bhand, Sunil. Identification and analysis of cations and anions of industrial effluents. Devi Ahilya. Dr K K Chaturvedi, Professor, Department of Chemistry, Holkar Science College, Indore.

3. Bhardwaj, Avinash. Catalytic vapour phase nitroxidation and ammonoxidation of picolines. Devi Ahilya. Dr R Prasad, Department of Chemistry, Devi Ahilya Vishwavidyalaya, Indore.

4. Bhonsle, Laxmikant H. Alkaloids in Tissue culture of

- heterostemma tanjorensis W&A (Asclepiadaceae). Goa. Dr U M X Sengodkar.**
5. Chaturvedi, Kamla Kant. Exafs studies of coordinated sulpha drugs and their derivatives by chelation with transition and rare earth metals.
 6. Dharmdasji, Hemchandra Wasnik. Studies on environmental factors at thermal power plant and their effects on process water quality and remedial measures. Nagpur. Prof R B Kharat, Former Director, Institute of Science, Nagpur.
 7. Doulton, Daya Keshawdas. Studies on ion-exchange properties of natural polymeric substances. Nagpur. Dr P V Patil, Reader in Chemical Technology, L.I.T. Nagpur.
 8. Dwivedi, Manoj. Kinetics and mechanism of osmium tetroxide catalysed oxidation of some cyclic alcohols by chloramine-T. Bundelkhand. Dr Rajkishore Shukla, Head, Department of Chemistry, Bundelkhand University, Jhansi.
 9. Gupta, Sanjay. Conductance and ultrasonic velocity studies of electrolytes in N,N-dimethylformamide-dimethylsulphur oxide solvent system at different temperatures. HP.
 10. Hota, Satya Prava. Behaviour of Schiff base in organised assembly. Sambalpur. Dr G B Behera Professor, P.G. Department of Chemistry, Sambalpur University, Jyoti Vihar.
 11. John, Valamma. Modification of polyamide film by radiation induced graft copolymerization method. HP.
 12. Kamble, Dasharath Laxman. Kinetic and mechanistic studies of some oxidation - reduction reactions. Karnataka. Dr S T Nandibewoor, Department of Chemistry, Karnatak University, Dharwad.
 13. Kar, Sukhendu Kumar. Investigation on co-ordination compounds containing multi dentate azo dyes as ligands. Sambalpur. Dr B B Mohapatra, Lecturer in Chemistry, G.M. College, Sambalpur.
 14. Maddali, Lakshminarayana Rao. Development of new organic synthetic methods based on borane reagents and alkyne-dicobalt hexacarbonyl complexes. Hyderabad. Prof M Periasamy.
 15. Malik, Bhiwa L. Transformation Studies of Terpenoids and New synthesis of benzofuro benzofurans. Goa. Dr S K Paknikar.
 16. Mandal, Gagan Chandra. Some aspects of mixed-ligand complexes of manganese, peroxy compounds of molybdenum and biomimetic chemistry of vanadium bromoperoxidase. NEHU. Prof M K Chaudhuri.
 17. Meera V. Surface electron properties and catalytic activity of perovskite-type mixed oxides (ABO₃) consisting of rare - earth and 3d transition metals. Cochin. Dr S Sugunan, Professor, Department of applied Chemistry, Cochin University of Science and Technology, Kochi.
 18. Pathania, Anita. Phytochemical studies of digitalis lanatae (leaves) rumex hastatus linn (roots) and agave cantala roxb (rhizomes). HP.
 19. Praveen M. New strategies for natural products synthesis based on tricycle (5.3.1.0.2,6) decane ring system. Hyderabad. Professor G Mehta.
 20. Ranbir Singh. Thermal, spectral and morphological studies on nitrogen and phosphorus containing cellulose derivatives. Kurukshetra.
 21. Rao, R. Ramachandra. Applications of zeolite molecular sieves for the synthesis of fine chemicals. Osmania. Dr S J Kulkarni, I.I.C.T., Hyderabad.
 22. Rao, T. Siva. Kinetic investigations and analytical applications of some thallimetric oxidations. Andhra.
 23. Sandhya Rani D. Synthesis and structural elucidation of transition metal complexes derived from multidentate 2,3-disubstituted quinoxalines. Osmania. Prof V Jayatyagaraju, Department of Chemistry, Osmania University, Hyderabad.
 24. Sipani, Meenu Rajendra. Processes for removal of organochlorine compounds in aquatic system. Nagpur. Dr (Mrs) N P Thacker, Basic Research and Training Division of NEERI, Nagpur.
 25. Srinivas, B. A Spectrophotometric study on the interaction of N-N, N-O and O-O Donors with cobalt (III) complexes. Osmania. Prof A V Chandrapal, Professor of Chemistry, Osmania University, Hyderabad.
 26. Sudha Y. Development of new and cleaner methods for organic synthesis. Osmania. Dr B M Choudary, I.I.C.T. Hyderabad.
 27. Suryanarayanan, M P. Kinetic and mechanistic studies on the thermal decomposition of zinc oxalate dihydrate by thermogravimetric methods. Chemistry, University of Calicut, Calicut.
 28. Suveer Kumar C.M. Absorption difference and comparative absorption spectra as probe in elucidation of structures of praseodymium (III) and neodymium (III) complexes with nucleotides and nucleic acids. Bhavnagar. Professor S N Misra, Professor and Head, Chemistry Department, Bhavnagar University, Bhavnagar.
 29. Trivedi, Pramod Kumar. Studies on some mixed-ligand derivatives of metal-chelates of beta-diketones and alike ligands with heterocyclic organic compounds. Rani Durgavati. Dr D D Mishra, Head and Dr R C Mourya, Department of Chemistry, Rani Durgavati Vishwavidyalaya, Jabalpur.
 30. Vasudeva, P. K. Nucleophilic ring opening studies on benzyl anhydroribopyranosides. Hyderbad. Prof M Nagarsjan.
 31. Verma, Ashok Kumar. Transport studies across model membrane based on thermodynamics of irreversible process. Bundelkhand. Dr R S Kushwaha, Reader, Chemistry Department, Bipin Bihari College, Jhansi.
- Physics**
1. Ansari, Mohammad Habeebul Haque. Some aspects of the philosophical and mathematical foundation of modern physics. AMU. Prof M Z R Khan, Department of Physics, Aligarh Muslim University, Aligarh.
 2. Gandhi, Yashesh Hasmukhlal. Thermoluminescence and allied studies of synthetic quartz and its applications. Baroda.
 3. Gulabrai, Deepak Kumar. Scattering of electrons by atoms and calculation of DCS and TCS using high energy approximation. Baroda.

4. Hiremath, S.S. Interaction of UV radiation with organic liquid scintillators. Karnataka. Dr G C Chikkur, Department of Physics, Karnatak University, Dharwad.
5. Mahavir Singh. Electrical, magnetic, microstructural properties and moesbauer studies of In 3+ and AL 3+ substituted Mg-Mn ferrites. HP.
6. Mandal, Jagdhar. A Binding to nuclear matter. Jamia. Prof G N Usmani, Department of Physics, Faculty of Natural Sciences, Jamia Millia Islamia, New Delhi.
6. Murari, Ajay. Exafs phase shift studies of some copper compounds and complexes. ISM. Prof A R Chetal, Indian School of Mines, Dhanbad.
8. Pandya, Ishwarlal. Structural response of partially steel fibre reinforces concrete deep beams. Baroda. Siddiqui, Bilquees Ara. Studies on treatment and disposal of electroplating waste. Aligarh. Dr Rafaqat Ali Khan
9. Purushotham, Y. Influence of monovalent and divalent additions on magnetic, electrical and elastic behaviour of Sr Zn-W hexagonal ferrites. Osmania. Dr P Venugopal Reddy, Department of Physics, Osmania University, Hyderabad.
10. Rajender Singh. Electronic and structural properties of amorphous chalcogenide semiconductors containing transition/non-transition metallic impurities. M D Rohtak. Prof K L Bhatia, Dr Naval Kishore.
11. Routray, Tusr Ranjan. Studies in semi classical nuclear properties in the energy density formalism. Sambalpur. Dr Basudeb Behera, Reader, Post Graduate Department of Chemistry, Sambalpur University, Jyoti Vihar.
12. Shanghi, Sujata. Study of some nonlinear processes: Optical materials. M D Rohtak. Dr R D Singh.
13. Shrivastava, Sushama. Photo conductivity of some II - VI compounds. Ravishanker. Dr Shashi Bhushan.
14. Thomas, Jayan. Electro-optical properties of metal phthalocyanines and naphthalocyanines. Cochin. Dr V N Sivasankara Pillai, Professor, Department of Environmental Studies, Cochin University of Science and Technology, Kochi.
15. Usha K. Applications of polymers in separation science. Cochin. Prof V N Sivasankara Pillai, Department of Environmental Studies, Cochin University of Science and Technology, Kochi.
16. Wagh, P.M. Theoretical study of some properties of low dimensional semiconductor structure. Karnataka. Dr S S Kubakaddi, Department of Physics, Karnatak University, Dharwad.

MATHEMATICAL SCIENCES

Mathematics

- Dwivedi, Uma Shankar. Boundary value problem for one parameter system of Differential Equation. Veer Kunwar.
- George, Santosh. Approximation methods for illposed operator equations. Goa. Dr M T Nair.
- Kanwar, Vinay. Hydrodynamic and hydromagnetic instabilities that arise either from velocity shear or double-diffusive convection. HP.
- Kishan, N. Computational techniques in MHD Head Transfer and Turbulent flows. Osmania. Dr Madhusudan

Bangad, Professor of Mathematics, Osmania University, Hyderabad.

S. Maulick, Banjul. Some mathematical models to study the elastic waves and vibrations. ISM. Prof S Dey, Indian School of Mines, Dhanbad.

6. Mesquita, Sebastiao B. Some Mathematical problems in oceanography. Goa. Dr Y S Prahalad.

7. Modi, Ashok Kumar. Studies of commutativity of rings and near-rings. Nagpur. Dr R D Giril, Department of Mathematics, Nagpur University, Nagpur.

8. Ramakrishnan, T.V. A study on fuzzy semi inner product spaces. Cochin. Dr T Thrikkaran, Professor, Department of Mathematics, Cochin University of Science and Technology, Kochi.

9. Rosa, M.V. A study of Fuzzy convexity with special reference to separation properties. Cochin. Dr T Thrikkaran, Professor, Department of Mathematics, Cochin University of Science and Technology, Kochi.

10. Sonwalkar, Alok. Some problems on general topology. Devi Ahilya. Dr U D Tapi, Department of Mathematics, S.G.S.I.T.S. Indore.

11. Srinivas, T. Near-rings and application to function spaces. Kakatiya. Prof A Radhakrishna (Retd.) Department of Mathematics, kakatiya University, Warangal.

12. Thekeveed, Ravindran Kunath. On the study of dimension functions of von neuman algebras relative to groups of automorphisms. Calicut. Dr M S Balasubramani, Lecturer, Department of Mathematics, University of Calicut, Calicut.

Statistics

1. Gopalakrishnan, Asha. Some bivariate life time models in discrete time. Cochin. Dr N Unnikrishnan Nair, Head, Department of Statistics, Cochin University of Science and Technology, Cochin.

2. Gopinathan, Unnithan V.K. Some contribution to the problem of optimum stratification. Cochin. Dr N Unnikrishnan Nair, Professor and Head, Department of Statistics, Cochin University of Science and Technology, Kochi.

3. Pathak, Umesh Kumar. Analysis and estimation of parameters of some queueing systems. Bundelkhand. Dr Vijay Kumar Sehgal, Reader, Department of Mathematics and Statistics, Bundelkhand University, Jhansi.

MEDICAL SCIENCES

Medicine

1. Gomes, Maria B. Ethnomedicine and Healing practices in Goa. Goa. Dr W R da Silva.

Neurophysiology

1. Rao, Nuddanna S. Experimental study of neural recovery and patterns of survival and degeneration. NIMHANS. Dr T R Raju.

Pharmacy

1. Khapra, Pankaj Kumar. Formulation studies of some drugs using novel drug delivery system. Devi Ahilya. Dr S C Chaturvedi, Head, Department of Pharmacy, Sh. G.S.I.T.S. Indore.

CLASSIFIED ADVERTISEMENTS

MAR ATHANASIUS COLLEGE ASSOCIATION KOTHAMANGALAM-686 666 KERALA

Applications are invited for the following posts in the Mar Athanasius College of Engineering, Kothamangalam.

- | | |
|--|---------------|
| 1. Lecturer in Civil Engineering | (Anticipated) |
| 2. Lecturer in Mechanical Engineering | (- do -) |
| 3. Lecturer in Electrical & Electronics Engineering | (- do -) |
| 4. Lecturer in Electronics & Communication Engineering | (- do -) |
| 5. Tradesman — Motor Mechanic | 1 |
| 6. Tradesman — Diesel Mechanic | (Anticipated) |

Scale of pay, Qualifications and Age will be as per norms prescribed by the A.I.C.T.E. and Mahatma Gandhi University for category 1 to 4.

Category 5 & 6

Scale of pay : Rs. 825-15-900-20-1200-25-1250

Qualifications : JTSCLC or I.T.I. or KGCE or City and Guilds Examination in the concerned Trade.

Age limit : Should have completed 19 (nineteen) years of age and should not have completed 36 (Thirty six) years of age as on 1-1-1996.

Application forms and other details

can be had from the Principal, Mar Athanasius College of Engineering, Kothamangalam-686 666, Kerala on payment of Rs. 100/- in person or Rs. 100/- by D.D. for category 1 to 4 and Rs. 50/- in person or Rs. 50/- by D.D. for category 5 and 6 drawn in the name of the Secretary, M.A College Association, Kothamangalam with a self addressed envelope 23 x 10 cm. affixing postal stamp worth Rs. 9/- Filled up applications should reach the office of the Secretary, Mar Athanasius College Association, Kothamangalam within 30 days of the publication of this advertisement.

SECRETARY

SHAHEED BHAGAT SINGH COLLEGE OF ENGINEERING & TECHNOLOGY P. BOX NO. 20, MOGA ROAD, FEROZEPUR - 152001 (Established by the Punjab Government)

Advertisement No. 3 (1996-97)

Applications are invited for the posts of Lecturers in the pay scale of Rs. 2200-4000 in the following subjects/specialisations on the prescribed application form. The application form complete in all respects and accompanied by required testimonial should reach the office of the Principal latest by 15.01.1997.

- | | | |
|------------------------|----|-------------------------|
| 1. Mechanical Engg. | 02 | (Gen. - 01, SC/ST - 01) |
| 2. Production Engg. | 01 | (General) |
| 3. Electrical Engg. | 02 | (Gen. -01, SC/ST - 01) |
| 4. Chemical Engg. | 02 | (Gen. - 01, SC/ST - 01) |
| 5. Industrial Engg. | 02 | (Gen. 01, SC/ST - 01) |
| 6. Applied Physics | 02 | (Gen. - 01, SC/ST - 01) |
| 7. Applied Chemistry | 02 | (Gen. -01, SC/ST - 01) |
| 8. Applied Mathematics | 02 | (Gen. 01, SC/ST - 01) |

Qualifications :

First class bachelor's degree in appropriate branch of engineering/technology OR First class master's degree in applied sciences. For posts at S.No. 3, bachelor's degree in electrical engineering or instru-

mentation engineering is required.

Candidates holding first class master's degree in appropriate branch of engg./technology or Ph.D. degree in applied sciences will be preferred. For posts at S.No. 3, master's degree in computer

science & engineering will be preferred.

General Requirements :

a) Prescribed application form is obtainable from the office of Principal by sending crossed D.D. of Rs. 30/- favouring Principal, SBSCET and payable at Ferozepur. For SC/ST categories a D.D. of Rs. 15/- is required. Request for application form must be accompanied by D.D. of the required amount and a stamped (with Rs. 2/- postal stamps) self addressed envelop of size 26cm x 12cm. Write clearly the name of the post for which you are an applicant on the top of the said envelop.

b) In case suitable candidates belonging to reserved categories are not available the posts will be filled with suitable candidates from the open category.

c) Candidates in government/semi-government service should apply through proper channel. An advance copy on prescribed form alongwith attested copies of certificates/supporting documents may be sent directly to ensure timely submission. No Objection Certificate' should be produced at the time of interview. Self attestation of documents is not acceptable.

d) Number of posts can be varied at the time of interview.

**R.C. Bahi
PRINCIPAL**

THE COCHIN EDUCATION SOCIETY COCHIN COLLEGE BUILDINGS KOCHI-2

Require for the Cochin College, Jr. Lecturer (Pre-Degree) in Economics and Hindi. Master's Degree in the subject with 50% marks and above with B.Ed. Degree are considered as per Govt. directive. Those who have passed Eligibility Test of UGC/CSIR are also considered. The recruitment is for teaching at the pre-Degree level and selected candidates will be eligible for State's pay scale only. The candidates should not have completed 35 years on 1-1-97. Qualified candidates may apply in the prescribed form available from college office on payment of Rs 100/- (Rs. 110/- if required by post). Last date for receipt of completed application is 4-1-97.

PRESIDENT

draft of Rs. 15/- (fifteen) for one set of form, drawn in favour of the Finance Officer, Assam University on State Bank of India REC Campus, Silchar Code No. 7061 alongwith a requisition for application to the Registrar, Assam University, P.B.No. 63, Silchar-788001, for Assam on or before 15.1.1997.

Complete application form for faculty position must be accompanied by application fee of Rs. 50/- (Rs. 25/- for SC/ST/ Physically Handicapped) in the shape of demand draft drawn in favour of Finance Officer, Assam University payable on S.B.I., REC Campus, Silchar (Code 7061) and may be addressed to the Registrar, Assam University, P.B.No. 63, Silchar-788001. Last date of receipt of application is 25.1.1997.

The University reserves the right to negotiate with suitable persons who may not have applied formally. The University also reserves the right to fill up or not to fill up any post or to call only selected candidates for interview.

Administrative Post :

4. Section Officer - 2 posts.

Reservation : One post of Section Officer is reserved for SC and one for OBC.

Pay Scale : Rs. 2000-60-2300-EB-75-3200-100-3500/- P.M.

Educational qualification and experience required for the post of Section Officer

- i) A degree in Science/Arts/Commerce from a recognised University.
- ii) Minimum 10(ten) years experience in office administration out of which 5(five) years should be in a post carrying pay scale of Rs. 1640-60-2600-EB-75-2900/-.

Age:

Minimum 18 years and maximum 32 years as on 1.12.96 However age may be relaxed in case of SC/ST candidate and in respect of employees working under State/Central Govt./Public Sector Organisations as per Central Govt. rules.

Eligible candidates may apply in standard form giving full particulars alongwith relevant testimonials and application fee of Rs. 25/- in the shape of draft drawn in favour of the Finance Officer Assam University on S.B.I., REC Campus, Silchar, Code No.7061, Application may be addressed to the Registrar, Assam University, P.B.No. 63, Silchar-1. Last date of receipt of application is 15.1.1997.

Assam University is a newly established teaching-cum-affiliating Central University which is now functioning from temporary accommodations. This advertisement is for the recruitment of fifth batch of teachers. The selected teachers and officers are expected to brave the initial inconveniences to take up the challenge of providing a strong academic foundation to the University with conviction, confidence and creativity.

P. S. Bhattacharjee
REGISTRAR

SAMBALPUR UNIVERSITY :
JYOTI VIHAR
Sambalpur-768 019 (Orissa)

Corrigendum No. 17787 Estt-IV
dated 29.11.96

The reservation made for the post of Lecturer in Computer Science and Engineering for University College of Engineering, Buria vide Advertisement No.14261/ Estt-IV dated 8.10.96 is modified as follows :-

Lecturer in computer Science and Engineering.

ST	SC	General	Total
1(one)	1(one)	3(three)	5(five)

The last date of receipt of application from SC Candidate is 30.12.1996.

REGISTRAR

GUJARAT VIDYAPITH :
AHMEDABAD - 380014
SPECIAL RECRUITMENT DRIVE FOR SC/ST CANDIDATES ONLY

Applications for the following reserved posts are invited from the SC/ST candidates only in prescribed form on or before 31-12-96.

1. Professor (4500-7300)
(i) History & Culture, (2) Social work,
(3) Hindi (Functional Hindi)
2. Reader (3700-5700)
(i) Gandhian Thought, (2) Hindi, (3) Physical Education (Sadra village campus), (4) History & Culture (Archival Science), (5) Social Anthropology.
3. Lecturer (2200-4000)

(i) Gujarati, (2) Rural Economics, (3) Rural Science Education Centre (Sadra village campus), (4) Home Science (Randheja village campus), (5) Social Work, (6) Food Science (Randheja village campus), (7) Computer Education, (8) Electronics (Randheja village campus), (9) Peace Research, (10) Hindi Education, (11) Asstt. Director (M.Ed. correspondence), (12) History & Culture (Sadra village campus).

Application forms can be obtained by paying cash Rs. 5/- or by M.O. of Rs. 7/- Candidates must write their name and address in M.O. slip.

S.K. Patil
ACTG. REGISTRAR

INSTITUTE FOR SOCIAL AND ECONOMIC CHANGE

DR. V K R V RAO, NAGARBHAVI PO BANGALORE 560 072
ADVT. NO. 1/18.320

Applications are invited for the following posts :

1. Professor of Economics - One Post
2. Associate Professor Economics - One Post
3. Publications Officer (equivalent to Assistant Professor) - One Post
4. Computational Assistant (reserved for SC/ST Candidates) - One Post

Educational Qualifications :

Post 1 : a) Master's degree in the subject with 50% marks in the aggregate;

b) Ph. D. or published work of equivalent standard in the subject;

c) 10 years teaching and/or research experience in the subject;

d) Publications in the subject.

Post 2 : a) Master's degree in Economics with minimum 50% marks in the aggregate;

b) Ph.D. or published work of equivalent standard in the subject;

c) 5 years teaching and/or research experience in the subject;

d) Publications in the subject.

Post 3: a) Master's degree in any of the Social Science subject, Diploma/Master's degree in Journalism;

b) Minimum five years experience in the field of preparation of annual reports/editing of books/manuscripts, dealing with the publishers and other related works connected with the publications.

c) Knowledge of computer operation.

Post 4: a) Bachelor's degree in Economics/Statistics/Mathematics/ with 50% marks in the aggregate;

b) Experience in the use of computer and knowledge with different software packages.

Desirable Qualification :

Post 1: Research work of high quality in Public Economics/Industrial Economics.

Post 2: Experience in conducting research and specialisation in Industrial Economics/International Trade/Urban Economics/Public Economics.

Post 4: i) Familiarity with data from Census, sample surveys and official records on population;
ii) Candidates with Master's degree would be preferred;
iii) Knowledge of Kannada.

Note : Those who have applied for posts 1 and 2 in response to the earlier advertisement need not apply again.

Scale of Pay :

Post 1: Rs. 4500-150-5700-200-7300 (Gross salary at the minimum of the scale is Rs. 10711.00)

Post 2: Rs. 3700-125-4700-150-5700 (Gross salary at the minimum of the scale is Rs. 9897.00)

Post 3: Rs. 2200-75-2800-100-4000 (Gross salary at the minimum of the scale is Rs. 6240.00)

Post 4: Rs. 1280-30-1400-40-1800-50-2300-75-2375 (Gross salary at the minimum of the scale is Rs. 3482.00)

Age :

Normally below 50 years for post 1, 40 years for post 2, 35 years for post 3, and 30 years for post 4. Age relaxable upto 5 years in case of SC/ST candidates. No age

limit in case of employees of the Institute.

The selection committee may relax qualification in exceptional cases and can also consider suitable candidates from outside the list of applicants. Higher start may be given in deserving cases according to rules.

Application forms and a copy of full advertisement can be had from the Registrar by sending a Bank draft for Rs. 25/- for post 1, Rs. 20/- for post 2, Rs. 15 for post 3. No application fee for the candidates belonging to Scheduled Caste and Scheduled Tribe. Last date for receipt of completed application is 31st January 1997 for Post 1, 2 and 3, 15th January 1997 for post 4.

Bangalore

December 5, 1996

REGISTRAR

**INSTITUTE OF MICROBIAL TECHNOLOGY
(C.S.I.R.)**

**SECTOR 39-A,
CHANDIGARH - 160 036
ADVERTISEMENT NO. 6/96**

For ongoing as well as planned activities of the Institute applications are invited for the following posts :-

Post No. 1. Scientist - 'C' Gr. IV (2) - Two Posts

Scale - Rs. 3000-100-3500-125-4500 (T.E. Rs. 9000/- Approx.).

Age : 35-years (as on 18.1.1997) (Relaxable upto 5-years for SC/ST and upto 3-years for OBC candidates).

In these positions incumbents are expected to undertake research projects either under the supervision of a senior investigator or independently and also to take up activities which may be assigned to them from time to time.

Post No. 1(i) - Scientist - 'C' Gr. IV (2)

Essential Qualifications :

1st class M.Sc. in Organic Chemistry with not less than 65% marks and 4 years R&D experience (*) OR Ph.D. in Organic Chemistry with one year Post-doctoral experience (*).

(*) of working on Microbial transformation with strong background of Physico-Chemical Techniques used to identify new Organo-chemical Structures as evidenced by published papers in reputed journals.

Job Requirements

The selected candidates will be re-

quired to work in the area of Bio-organic Chemistry/Microbial Transformation.

Post No. 1 (ii) - Scientist - 'C' Gr. IV(2)

Essential Qualification :

1st Class M.Sc. in Organic Chemistry/Biochemistry/Microbiology/Biological science with not less than 65% marks and 4-years R&D experience (*) OR Ph.D. in Biochemistry/Microbiology/Life Sciences with one year post-doctoral experience (*).

(*) of working in the area of molecular/cellular immunology as evidenced by the published papers in reputed journals.

Job Requirements :

The selected candidate will be required to work in the area of Cell Biology/Immunology.

Post No. 2 - Scientist 'B' Gr. IV(1) - ONE POST (Reserved for S.C. candidates).

Scale - Rs. 2200-75-2800-100-4000 (T.E. Rs. 6700/- Approx.).

Age : 40 Years (as on 18.1.1997) (including relaxation of 5 years available to S.C. candidates).

Essential Qualification :

1st Class M.Sc. in Biophysics/Bio-technology/Life Science with not less than 65% marks or Ph.D. (Science/Engg.)

Desirable

At least two years experience of working in Electron Microscopy laboratory or having used TEM/SEM including sample processing or extensive work experience in histocytochemistry and/or immunochromatography.

Job Description

To provide electron microscopy related services to the Scientists, routine maintenance of TEM and SEM and to assist in scientific research and other job assigned to him/her.

Post No. 3 Technical Asstt. Gr. III(I) - Three Posts (One Post reserved for S.C. Candidates)

Scale - Rs. 1400-40-1800-EB-50-2300 (T.E. Rs. 4300/- Approx.).

Age - 28 years (as on 18.1.1997) (Relaxable upto 5-years for SC/ST and upto 3-years for OBC candidates).

Post No. 3(ii) (Reserved for S.C. Candidates),

Post No. 3(iii) & 3(iii) (Unreserved)

Essential Qualification :

1st class B.Sc. with Physics, Chemistry, Math; OR Physics, Chemistry, Biology as subjects; OR 1st class B.Sc. (Hons.) in Chemistry/Biochemistry/Microbiology/Zoology.

Desirable

Relevant working experience in Biochemical/Chemical/Medical Laboratory in handling analytical equipments/Lab instruments.

Post No. 4 - Executive Engineer Gr. III(5) - ONE POST.

Scale - Rs 3000-100-3500-125-4500 (T.E. Rs 9000/- Approx.).

Age - 40 years (as on 18.1.1997) (as on 18.1.1997) (Relaxable upto 5-years for SC/ST and upto 3-years for OBC candidates)

Essential Qualifications :

B.E./B Tech (Civil Engg.) with not less than 9 years of relevant experience in supervision of major civil construction works at site. The candidate should have experience and versatility to ensure smooth running of all civil construction & maintenance services required for a large modern research laboratory-cum-residential complex

Post No. 5 - Asstt. Engineer (Electrical) Gr. III (3) - ONE POST (Reserved for S C candidates)

Scale . Rs 2000-60-2300-EB-75-3200-100-3500 (T.E. Rs 6170 Approx).

Age 35 years (as on 18.1.1997) (including Relaxation of 5 years available to SC candidates).

Essential Qualifications :

B.E. / B Tech (Elect) with 3-years relevant experience in electrical construction and maintenance service in large modern research laboratory-cum-residential complex.

Post No. 6 - Jr. Engineer (Civil) Gr. III(I) - One Post.

Scale - Rs. 1400-40-1800-F.B-50-2300 (T.E. Rs. 4300/- Approx.)

Age : 28 years (as on 18.1.1997) (Relaxable upto 5 years for SC/ST and upto 3 years for OBC candidates).

Essential Qualifications .

1st Class Diploma in Civil Engg. of 3-years full-time duration.

Desirable :

The candidates having experience in civil construction/maintenance work will be preferred.

Post No. 7 Jr. Engineer (Electrical) Gr. III

(1) **ONE POST (Reserved for S.C. candidate).**

Scale - Rs. 1400-40-1800-EB-50-2300 (T.E. Rs. 4300/- Approx.)

Age : 33 years (as on 18.1.1997) (including relaxation of 5-years available to S.C. candidates).

Essential Qualifications :

1st Class Diploma in Electrical Engg. of 3 years full-time duration.

Desirable :

The candidates having experience in electrical construction/maintenance services will be preferred.

Post no. 8 Technician Gr. II(I) - THREE POSTS (Two posts reserved for OBC candidates).

Scale : Rs. 950-20-1150-EB-25-1400 (T.E. Rs. 3000/- Approx.)

Age - 28 years (as on 18.1.1997) (Relaxable upto 5 years for SC/ST and upto 3 years for OBC candidates)

Post No. 8(i) - Technician Gr. II(I) (Reserved for OBC candidates)

Essential Qualification :

SSC/10th standard with 50% marks in the aggregate and ITI certificate of 2 years duration in Mason.

Desirable :

Relevant working experience in the field of civil Masonry work.

Post No. B(ii) - Technician Gr. II(I) (Unreserved).

Essential Qualification :

SSC/12th with Physics, Chemistry, Math as subject and a minimum of 60% marks in aggregate

OR

SSC/10th standard with 50% marks in aggregate and ITI certificate of 2-years duration in Electronics.

Desirable :

Relevant working experience for maintenance and handling of EPABX System, Audio/Video equipments such as 35 mm projects, overhead projectors, slide projectors etc. etc.

Post No. 8 (iii) - Technician Gr. II

(I) (Reserved for OBC Candidate).

Essential Qualification :

SSC/12th with Physics, Chemistry, Math as subject and a minimum of 60% marks in aggregate.

Desirable :

Relevant working experience in Chemical/Biochemical/Medical Laboratory.

General Conditions :

Persons desirous to apply for more than one post, may submit Separate Application for Each Post.

The number of vacancies mentioned in each category is provisional and may vary at the time of selection.

Upper age limit is relaxable upto 5-years for SC/ST applicants and upto 3-years for OBC applicants.

The post of Scientists are contractual. The Scientist is initially appointed on contract for a period of 6-years, which is extendable/renewable further as per the orders/instructions issued by CSIR in this regard from time to time.

Relaxation in age limit, qualification and/or experience in case of exceptionally meritorious candidates (Both departmental or outsiders) is applicable.

Persons working in Govt. deptt./Undertaking/Autonomous Bodies should send their applications through proper channel.

For posts No.1, 2, 3, 4, 5, 6, & 7 [viz. Scientist-C, Scientist-B, Technical Asstt., Asstt. Engineer (Elect.), Jr. Engineer (Civil/Elec)] - the application may be submitted on the prescribed form which can be obtained free of cost from the Controller of Administration, Institute of Microbial Technology, Sector 39-A, Chandigarh - 160 036. In case the application form is desirable by post, the request indicating number of the advertisement, name of the post applied for, post No., etc. etc. should be accompanied by a self-addressed envelope of 27 cms x 10 cms bearing postage stamps of Rs. 2/-, which should reach the office, at the address mentioned above, on or before 10.1.1997 positively.

For Posts No.8 (viz. Technician) - the application may be submitted on plain paper indicating (1) Name of the post applied for and Post No. (2) Candidate's Name (in Block letter) (3) Father/Husband Name (4) Date of Birth (5) address for com-

munication (6) Permanent Address (7) Qualification showing (a) Degree/Diploma/Certificate passed (b) Name of the University (c) Marks obtained/%age/Division (d) Year of passing (8) Technical Qualification (not covered under col. No. 7) (9) Experience, if any (10) Whether belongs to SC/ST/OBC (11) Whether you have any blood relation working in IMTECH/CSIR, if so, give details, with an **UNDERTAKING/DECLARATION** that I hereby declare that all the statements made in the application are correct and complete; and nothing has been concealed to the best of my knowledge and incorrect at any time, action may be taken against me and I shall abide by the decision, with signatures and date appended at the end of the application.

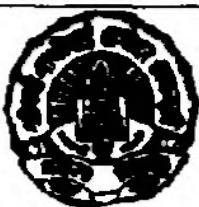
Complete application in the prescribed form together with non-refundable application fee of Rs. 25/- [No fee (i) for SC/ST candidate & for posts No. 8 (viz. Technician)] by means of Demand Draft drawn in favour of Director, Institute of Microbial Technology, Chandigarh, payable at Chandigarh, alongwith a recent passport size photograph pasted on the right hand side of the application form, alongwith attested copies of testimonials/certificates, detail marks certificates, must reach the Controller of Administration, Institute of Microbial Technology, Sector 39-A, Chandigarh - 160 036, latest by 18.1.97. Name of the post and the post number applied for should be clearly written in the application, failing which the application will not be considered. Incomplete applications including those received without attested copies of testimonials/certificates, etc. and/or those received after the last date, are liable to be rejected.

Canvassing in any form and/or bringing out any influence, political or otherwise, will be treated as a disqualification for the post.

Merely fulfilling the minimum prescribed qualifications and experience will not vest any right on a candidate for being called for interview. Since it may not be possible to call all the candidates for interview, the applications will be shortlisted for the purpose and the decision of a duly constituted Screening Committee will be final. The Institute will not entertain any correspondence in this respect.

A lower standard of suitability consistent with efficiency will be applied in respect of SC/ST candidates.

"INTERIM ENQUIRY WILL NOT BE ATTENDED TO"



S.N.D.T. Women's University

1. Naihibai Thackersey Road, Mumbai-400 020

Advertisement No. 5 of 1996

Applications are invited for the following positions to be filled in at Mumbai and Pune Campuses of the University. Prescribed application forms are available on payment (Cash or by Demand Draft issued in favour of the Registrar, S.N.D.T. Women's University, Mumbai, of Rs. 25/- (Rs. 20/- for SC/ST/DTNT/OBC) for academic and Rs 15/- (Rs. 12/- for SC/ST/DTNT/OBC) for non academic positions) from the above address on all working days between 10.30 a.m. to 2.30 pm. Pune posts are shown in the brackets

ACADEMIC POSITIONS

1. Principal- (1) S.N.D.T. College of Home Science (Pune) — Master's degree in Home Science and (2) S.N.D.T. Arts and Commerce College for Women (Pune) — Master's degree in Arts or Commerce (All applicants who had applied earlier are requested to apply again)

Note: The candidates should also necessarily fulfil the following basic conditions of qualifications

Basic Qualifications: Masters Degree in the respective subjects with atleast 55% marks or its equivalent grade and good academic record plus minimum experience of ten years of teaching at Undergraduate/Post Graduate level in the respective Colleges. Those with second class at Master's Degree or grade "C" in the seven point scale will be considered if they possess M.Phil./Ph.D. or teachers whose appointments have been approved by the University on the basis of old qualifications and who possess minimum of ten years of teaching experience at Undergraduate/Postgraduate level are also eligible. A Ph.D. and/or administrative experience will be considered as added qualifications. Salary Scale For position No 1--Rs 3700-125-4950-150-5700 and for position No 2 — Rs. 4500-150-5700-200-7300 plus admissible allowances

2. Professor: (a) Sociology. Specialisation in Theoretical/Political Sociology preferred (b) Family resource Management (Against Lien)- Basic Qualifications for Professor positions — Eminent Scholar with published work of high quality, actively engaged in research with 10 years experience in Post Graduate teaching and/or research at the University/National level institution, including experience of guiding research at doctoral level OR an outstanding scholar with established reputation who has made significant contributions to the respective fields. Salary Scale Rs 4500-150-5700-200-7300 plus admissible allowances

3. Reader in Science/Mathematics Education (Pune-Lon) A good academic record with a doctoral degree or equivalent published work. Candidates from outside the University system should in addition also possess atleast 55% marks or an equivalent grade at the Master's degree level. Eight years experience of teaching and/or research (of which a maximum three years could be work for research degree). Other requirements: M.Sc. in Science/Mathematics with Master's Degree in Education. Salary Scale Rs 3700-125-4950-150-5700 plus admissible allowances

4. Lecturer in Education (Pune) — For SC-PG) A good academic record with atleast 55% marks or an equivalent grade at Master's Degree in Education with any one specialisation in Guidance Counselling/Educational Technology/Education Management from an Indian University or an equivalent degree from a foreign University and should have cleared the eligibility test for lecturers conducted by the UGC, CSIR or similar test accredited by the University Grants Commission unless the candidate has cleared UGC, JRF examinations or holds M.Phil. Degree obtained prior to 31.12.1993 or holds a Ph.D./submitted Ph.D. thesis by 31.12.1993. Salary Scale Rs. 2200-75-2800-100-4000 plus admissible allowances

NON ACADEMIC POSITION

1. Site Engineer (1) Graduate with Diploma in Civil Engineering from recognised institutions (2) Three years experience in similar field and (3) Not Less than 25 years of age and unless already in the service of the University or affiliated colleges not more than 35 years of age. Salary Scale 2000-60-2300-EB-75-3200-100-3500 plus admissible allowances

Applications in the prescribed forms should reach the Registrar on or before January 10, 1997. Applications which will be received after the due date or on plain papers or incomplete applications will not be considered. Only one position of Lecturer in Education (Pune-PG.) is reserved, other remaining positions are open to all.

Dr. Hemlata Parashis
Registrar